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## **TEACHERS' BOOK THREE**

**BLACKIE & SON LIMITED**

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# THE NEW OUTLOOK ARITHMETIC

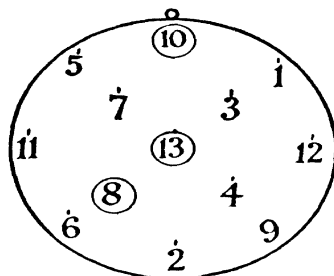
FOR JUNIOR SCHOOLS

TEACHERS' BOOK THREE

BY

~~E. KENYON~~, L.C.P., M.R.S.T.

Head Master of Ropery Road Boys' School,  
Gainsborough



BLACKIE & SON LIMITED  
LONDON AND GLASGOW

1939





## P R E F A C E

The four books of the New Outlook Arithmetic for Juniors have been designed to fulfil the latest requirements of the Board of Education, as set out in their recent publications dealing with the subject. They provide a sound and progressive scheme of work for pupils of all attainments in the Junior School.

In this series the utmost care has been given to the selection of the material, the grading of the work, and the method of presentation. Never, at any stage, is the work allowed to become unpractical or unreal. The exercises in themselves are interesting, and will appeal to the child. Every process is dealt with in just the right amount of detail, and the examples are not too difficult at any stage.

In weights and measures there is a complete departure from traditional features. Table items, and examples involving their use, are limited to those most commonly met with in the arithmetic of practice. Useless traditional examples, involving a wide range of units, have been intentionally omitted, and the child is not called upon to master examples in long division and long multiplication (weights and measures).

Decimals call for little attention, and more attention is given to work in vulgar fractions and their applications — both being in accordance with the new doctrine.

The large number of carefully graded mechanical exercises, planned to give the necessary practice and systematic revision in the “ essentials ” throughout the course, makes this series a veritable “ training ground ” for future speed and accuracy.

The books breathe the spirit of real arithmetic, but are well devoid of mathematical formality. The teachers’ pages provide what is practically a treatise on the teaching and presentation of arithmetic.

My sincere thanks are due to Mr. A. Musgrove, who is responsible for the originals of many of the drawings and pictures to be found in the books.

E. K.



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# **TEACHERS' BOOK THREE**

## Exercise 1

### Revision

#### A. NUMBER

1.  $32 + 26$ .
2.  $17 + 29 + 53$ .
3.  $177 + 88 + 239$ .
4.  $113 + 15 + 123 + 346$ .
5.  $76 - 34$ .
6.  $52 - 37$ .
7.  $273 - 136$ .
8.  $720 - 436$ .
9.  $72 \times 4$ .
10.  $26 \times 8$ .
11.  $75 \times 12$ .
12.  $156 \times 6$ .
13.  $7 \overline{)84}$ .
14.  $11 \overline{)123}$ .
15.  $5 \overline{)629}$ .
16.  $9 \overline{)909}$ .
17. Find the sum of nineteen, seventy-nine, and three hundred and eight.
18. Take two hundred and five from seven hundred and seventy-six.
19. Find the product of one hundred and thirty-six and seven.
20. How many eights are there in eight hundred and two?

#### B. MONEY

1.  $6\frac{1}{4}d. + 4\frac{1}{2}d. + 9\frac{1}{2}d.$
2.  $3s. 9d. + 7s. 8d.$
3.  $6\frac{1}{2}d. + 3s. 4\frac{1}{4}d. + 1s. 2\frac{1}{2}d. + 5s. 2\frac{1}{2}d.$
4.  $\pounds 3. 5s. 4d. + 13s. 7d. + \pounds 1. 7s. 11d.$
5.  $10s. 0d. - 7s. 5\frac{1}{4}d.$
6.  $12s. 3\frac{1}{4}d. - 6s. 9\frac{1}{2}d.$
7.  $\pounds 3. 12s. 9d. - 14s. 10d.$
8.  $\pounds 5. 7s. 8d. - \pounds 1. 13s. 8\frac{1}{2}d.$
9.  $2s. 9d. \times 5$ .
10.  $2s. 4\frac{1}{2}d. \times 7$ .
11.  $\pounds 1. 3s. 5\frac{1}{2}d. \times 5$ .
12.  $\pounds 1. 4s. 9\frac{1}{2}d. \times 8$ .
13.  $5 \overline{)15s. 11\frac{1}{4}d.}$
14.  $9 \overline{)19s. 8\frac{1}{4}d.}$
15.  $11 \overline{)16s. 8\frac{3}{4}d.}$
16.  $7 \overline{)\pounds 8. 2s. 9d.}$
17. Find the total of sixpence halfpenny, one shilling and threepence, and ninepence three farthings.
18. Find the difference between seventeen shillings and elevenpence, and one pound and tenpence.
19. Multiply thirteen shillings and fourpence halfpenny by nine.
20. Share one pound one shilling and tenpence halfpenny by seven.

## Exercise 1

### Revision

#### ANSWERS

A		B	
1. 58	11. 900	1. 1s. 8½d.	11. £5. 17s. 3½d.
2. 99	12. 936	2. 11s. 5d.	12. £9. 18s. 4d.
3. 504	13. 12	3. 10s. 3¾d.	13. 3s. 2¼d.
4. 597	14. 11 (2 R)	4. £5. 6s. 10d.	14. 2s. 2¼d.
5. 42	15. 125 (4 R)	5. 2s. 6¾d.	15. 1s. 6¼d.
6. 15	16. 101	6. 5s. 5¾d.	16. £1. 3s. 3d.
7. 137	17. 406	7. £2. 17s. 11d.	17. 2s. 7¼d.
8. 284	18. 571	8. £3. 13s. 11½d.	18. 2s. 11d.
9. 288	19. 952	9. 13s. 9d.	19. £6. 0s. 4½d.
10. 208	20. 100 (2 R)	10. 16s. 7½d.	20. 3s. 1½d.

### Notation and Numeration to 5,000

**Practical Work.** Continue numeration and notation along the lines suggested in Teachers' Books I and II. Cut from squared paper 10 single squares (units), 10 ten-slips (tens), 10 hundred-squares (hundreds), and 5 thousand-square pieces (thousands).

A. Show by laying squares that 10 hundreds = 1 thousand.

B. (a) Lay squares to show 2 thousand, 3 thousand, 4 thousand. As each number is correctly formed it should be written in figures in columns

Th. H. T. U.  
2, 0 0 0

(b) Lay squares to show two thousand four hundred, three thousand seven hundred, etc.

2, 4 0 0  
3, 0 4 0

(c) Lay squares to show three thousand and four tens (forty), etc.

3, 0 0 6

(d) Lay squares to show three thousand and six, four thousand and nine, etc.

3, 4 3 9

(e) Lay squares to show three thousand four hundred and thirty-nine.

(Note: (a), (b), (c), (d), and (e) indicate the correct stages of the work.)

C. Lay squares to show the number that comes before (after) 3,337; 2,315, etc. Write your answers in figures.

## Exercise 2

### Number. Reading, Writing, and Splitting-up Numbers

1. (a) How many small squares are there altogether in the picture? (b) If two more hundred squares be added, how many would there be then?

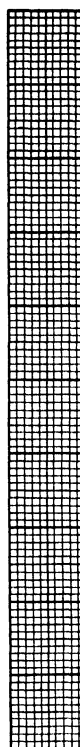
2. If three more hundred squares and four more ten-slips be added to the squares in the picture, how many squares would there be then?

3. Write in figures: (a) Seventy-seven; (b) four hundred and eleven; (c) one thousand five hundred and nineteen; (d) three thousand five hundred and thirty-six.

4. Write in figures: (a) One thousand three hundred and sixty; (b) two thousand three hundred and nine; (c) three thousand and seventy-four; (d) four thousand and fifty; (e) three thousand and thirty; (f) two thousand and ninety-six; (g) three thousand four hundred and fifty; (h) two thousand three hundred and thirty-seven.

5. Read to your friend: 3,217; 1,309; 1,057; 4,006; 2,030; 1,519; 3,273.

6. Write what each figure stands for in each of the following numbers: 2,357; 1,430; 2,057; 3,209; 1,598; 2,222. No. 1 has been done below for you.  
 $2,357 = 2,000$  (2 thousand) +  $300$  (3 hundred) +  $50$  (5 tens) +  $7$  units.



1 thousand	1 hundred	1 ten	one
(1,000)	(100)	(10)	(1)



## Exercise 2

### Number. Reading, Writing, and Splitting-up Numbers

#### ANSWERS

- |   |  |
|---|--|
| <p>1. (a) 1,111; (b) 1,311.<br/>         2. 1,451.<br/>         3. (a) 71; (b) 411; (c) 1,519; (d) 3,536.<br/>         4. (a) 1,360; (b) 2,309; (c) 3,074;<br/>             (d) 4,050; (e) 3,030; (f) 2,096;<br/>             (g) 3,450; (h) 2,337.</p> | <p>5. —.<br/>         6. <math>2,000 + 300 + 50 + 7</math>; <math>1,000 + 400 + 30</math>; <math>2,000 + 50 + 7</math>;<br/> <math>3,000 + 200 + 9</math>; <math>1,000 + 500 + 90 + 8</math>; <math>2,000 + 200 + 20 + 2</math>.</p> |
|---|--|

#### Notation (contd.)

1. Analysing numbers. In the number 3,536:

the 3	stands for	3,000
the 5	,, ,,	500
the 3	,, ,,	30
the 6	,, ,,	6
and, 3,536	,, ,,	$3,000 + 500 + 30 + 6$ .

2. Analysing numbers (another method). Read in as many ways as possible, the number 3,536.

$3,536 = 3,536$  units  
 $= 353$  tens + 6 units  
 $= 35$  hundreds + 36 units  
 $= 35$  hundreds + 3 tens + 6 units.

3. Roman Numerals. Capitals and smalls.

<p>Numbers up to 100.</p> <table border="0" style="margin-left: 40px;"> <tr> <td style="padding-right: 10px;">I (or i) stands for</td> <td style="padding-right: 10px;">1</td> <td rowspan="5" style="font-size: 4em; padding: 0 10px;">}</td> <td rowspan="5" style="vertical-align: middle;">           If small letters are used, i must be dotted, e.g. vii. If one letter is placed after another letter of the <i>same</i> or <i>higher</i> value, the two values are added together, e.g. II (2), III (3), VI (6), XX (20), etc. If a letter is placed before another of <i>higher</i> value, the value of the lower is subtracted from that of the higher, e.g. IV (4), IX (9), XIV (14), XIX (19), etc.         </td> </tr> <tr> <td>V (or v) stands for</td> <td>5</td> </tr> <tr> <td>X (or x) stands for</td> <td>10</td> </tr> <tr> <td>L (or l) stands for</td> <td>50</td> </tr> <tr> <td>C (or c) stands for</td> <td>100</td> </tr> </table>	I (or i) stands for	1	}	If small letters are used, i must be dotted, e.g. vii. If one letter is placed after another letter of the <i>same</i> or <i>higher</i> value, the two values are added together, e.g. II (2), III (3), VI (6), XX (20), etc. If a letter is placed before another of <i>higher</i> value, the value of the lower is subtracted from that of the higher, e.g. IV (4), IX (9), XIV (14), XIX (19), etc.	V (or v) stands for	5	X (or x) stands for	10	L (or l) stands for	50	C (or c) stands for	100	
I (or i) stands for	1	}			If small letters are used, i must be dotted, e.g. vii. If one letter is placed after another letter of the <i>same</i> or <i>higher</i> value, the two values are added together, e.g. II (2), III (3), VI (6), XX (20), etc. If a letter is placed before another of <i>higher</i> value, the value of the lower is subtracted from that of the higher, e.g. IV (4), IX (9), XIV (14), XIX (19), etc.								
V (or v) stands for	5												
X (or x) stands for	10												
L (or l) stands for	50												
C (or c) stands for	100												

- (a) Lay sticks to show the Roman numerals for 6, 19, 20, 24, 30, etc.  
 (b) Write in Roman Notation: 49 (XLIX); 27 (XXVII), etc.  
 (c) Read: XXVI; XXXVI; XLVI; LXXXIX, etc.

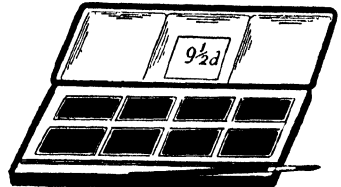
## Exercise 3

### Number (Notation). Addition

1. Read the following numbers in as many ways as you can: 271, 807, 17, 2,101, 3,356, 4,036.
2. (a) Write in figures: V, IV, VII, X, XIX, XXIII;  
(b) Write in Roman numerals: 3, 6, 8, 9, 14, 26.
3. (a) Read 5th, 1st, 3rd, 22nd, 36th; (b) write in the shortened form: fourth, ninth, twenty-first, thirty-third.
4. Read the following dates: 1066, 1314, 1415, 1600, 1870, 1900, 1938.

#### ADDITION

	(a)	(b)	(c)	(d)	(e)
5.	209	17	123	327	719
	76	293	216	89	115
	<u>358</u>	<u>356</u>	<u>357</u>	<u>216</u>	<u>79</u>
6.	3	12	27	1,257	2,117
	17	23	19	39	126
	56	136	156	536	239
	<u>1,116</u>	<u>2,128</u>	<u>1,334</u>	<u>198</u>	<u>176</u>
7.	17	1,315	1,376	1,253	703
	136	29	1,184	2,173	112
	1,455	356	172	916	1,315
	<u>1,612</u>	<u>2,154</u>	<u>1,236</u>	<u>345</u>	<u>2,106</u>

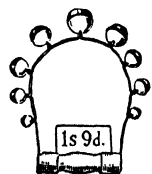
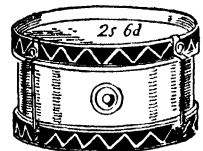


Add across:

8. (a)  $3+15+20+17$ . (b)  $5+12+30+27$ . (c)  $8+10+36+27$ .  
 9. (a)  $7+23+39+18$ . (b)  $12+12+50+19$ . (c)  $9+50+18+25$ .

Add, down and across:

	(a)		(b)			(a)		(b)		(c)	
10.	17	+	23	=		14.	37	+	59	+	37 =
11.	25	+	30	=		15.	29	+	84	+	73 =
12.	18	+	37	=		16.	16	+	63	+	59 =
13.	<u>26</u>	+	<u>59</u>	=	<u>—</u>	17.	<u>48</u>	+	<u>72</u>	+	<u>93 =</u>
	<u>—</u>		<u>—</u>		<u>—</u>		<u>—</u>		<u>—</u>		<u>—</u>
	(a)		(b)			(a)		(b)		(c)	
18.	73	+	58	=		22.	23	+	34	+	52 =
19.	11	+	76	=		23.	55	+	45	+	9 =
20.	36	+	65	=		24.	88	+	56	+	73 =
21.	<u>99</u>	+	<u>39</u>	=	<u>—</u>	25.	<u>73</u>	+	<u>67</u>	+	<u>18 =</u>
	<u>—</u>		<u>—</u>		<u>—</u>		<u>—</u>		<u>—</u>		<u>—</u>



### Exercise 3

#### Number (Notation). Addition

##### ANSWERS

(a)	(b)	(c)	(d)	(e)	
5. 643	666	696	632	913	18. 131
6. 1,192	2,299	1,536	1,930	2,658	19. 87
7. 3,220	3,854	3,968	4,687	4,236	20. 101
8. 55	74	81			21. 138
9. 87	93	102			Totals: 219; 238; 457
10. 40					22. 109
11. 55		14. 133			23. 109
12. 55		15. 186			24. 217
13. 85		16. 138			25. 158
		17. 213			Totals: 239; 202;
Totals: 86; 149;		Totals: 130; 278;			152; 593.
235.		262; 670.			

##### PRACTICAL WORK

Practical work and blackboard work should go hand-in-hand. Demonstrate by means of squares:

1. Addition: (a)  $1,300 + 1,200 + 1,600$ , etc.; (b)  $1,130 + 1,250 + 1,370$ , etc.; (c)  $1,330 + 1,250 + 1,670$ , etc.
2. Subtraction: (a)  $3,700 - 2,500$ , etc.; (b)  $3,500 - 1,600$ , etc.

##### ORAL WORK

(Blackboard Demonstration)

1.  $1,200 + 1,300 + 1,400$ ;  $1,400 + 1,500 + 1,600$ ;  $1,140 + 1,270 + 1,350$ ;  $1,240 + 1,350 + 1,660$ ; etc.
2.  $3,500 - 2,300$ ;  $4,500 - 2,700$ ;  $4,350 - 2,670$ ;  $4,321 - 2,835$ ; etc.

##### MISCELLANEOUS ORAL WORK

1. How many must be added to  $27 + 23 + 15$  to make 100? (35.)
2.  $9 + x + 12 = 30$ . Find  $x$ . (9.)
3. (a)  $18 \times 2$ ;  $18 \times 20$ ;  $18 \times 200$ . (b)  $18 \times 2$ ;  $180 \times 2$ ;  $1,800 \times 2$ .
4.  $2 \times 5 \times 6$  (60);  $4 \times 5 \times 8$  (160);  $3 \times 8 \times 5$  (120).
5. 10 times 37, 56, 79; 20 times 5, 16, 23, 28.
6. 40 times 4, 8, 28; 60 times 6, 9, 28.

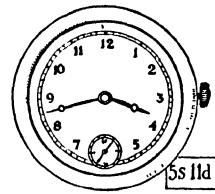
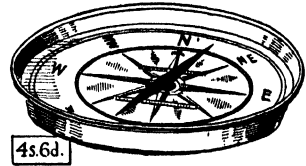
##### PICTORIAL WORK

Addition, subtraction (change), and multiplication of money, based on the pictures, pupil's page.

## Exercise 4

### Number. Subtraction

- |    | (a)   | (b)   | (c)   | (d)   |
|----|---|---|---|---|
| 1. | $\begin{array}{r} 98 \\ - 26 \\ \hline \end{array}$       | $\begin{array}{r} 696 \\ - 235 \\ \hline \end{array}$     | $\begin{array}{r} 1,958 \\ - 327 \\ \hline \end{array}$   | $\begin{array}{r} 4,993 \\ - 2,341 \\ \hline \end{array}$ |
| 2. | $\begin{array}{r} 33 \\ - 7 \\ \hline \end{array}$        | $\begin{array}{r} 87 \\ - 59 \\ \hline \end{array}$       | $\begin{array}{r} 374 \\ - 127 \\ \hline \end{array}$     | $\begin{array}{r} 2,790 \\ - 1,357 \\ \hline \end{array}$ |
| 3. | $\begin{array}{r} 314 \\ - 173 \\ \hline \end{array}$     | $\begin{array}{r} 2,328 \\ - 1,196 \\ \hline \end{array}$ | $\begin{array}{r} 3,518 \\ - 2,468 \\ \hline \end{array}$ | $\begin{array}{r} 4,500 \\ - 2,700 \\ \hline \end{array}$ |
| 4. | $\begin{array}{r} 323 \\ - 176 \\ \hline \end{array}$     | $\begin{array}{r} 3,520 \\ - 1,750 \\ \hline \end{array}$ | $\begin{array}{r} 4,318 \\ - 2,626 \\ \hline \end{array}$ | $\begin{array}{r} 4,723 \\ - 2,245 \\ \hline \end{array}$ |
| 5. | $\begin{array}{r} 3,111 \\ - 1,234 \\ \hline \end{array}$ | $\begin{array}{r} 4,231 \\ - 1,376 \\ \hline \end{array}$ | $\begin{array}{r} 4,437 \\ - 1,569 \\ \hline \end{array}$ | $\begin{array}{r} 4,320 \\ - 3,177 \\ \hline \end{array}$ |
| 6. | $\begin{array}{r} 4,237 \\ - 1,964 \\ \hline \end{array}$ | $\begin{array}{r} 3,700 \\ - 1,299 \\ \hline \end{array}$ | $\begin{array}{r} 1,865 \\ - 999 \\ \hline \end{array}$   | $\begin{array}{r} 3,075 \\ - 2,986 \\ \hline \end{array}$ |



### WORD SUMS

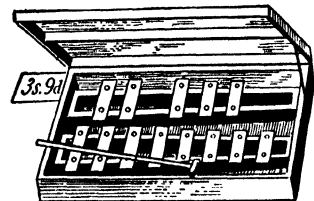
7. Subtract two thousand and eleven from three thousand four hundred and seventy.
8. Take one thousand three hundred and eighty-four from four thousand.
9. Three thousand and thirty-one minus one thousand and seventy-eight.
10. From two thousand and one take eight hundred and seventy-six.
11. Find the difference between eleven hundred and seventy-four and three thousand and twenty-six.
12. How much is one thousand and ninety-nine short of two thousand and thirty-nine?

### CHECKING ANSWERS

If the answer to a subtraction sum is correct, the sum of the answer and the bottom line (take away line) should give the top line.

Work the following subtraction sums and check your answers.

- | (a)                   | (b)               |
|-----------------------|-------------------|
| 13. $2,000 - 73$ ;    | $1,704 - 756$ .   |
| 14. $1,750 - 39$ ;    | $1,856 - 1,375$ . |
| 15. $3,156 - 1,273$ ; | $4,301 - 2,999$ . |
| 16. $4,000 - 9$ ;     | $3,201 - 199$ .   |



## Exercise 4

### Number. Subtraction

#### ANSWERS

(a)	(b)	(c)	(d)		
1. 72	461	1,631	2,652	9. 1,953	
2. 26	28	247	1,433	10. 1,125	
3. 141	1,132	1,050	1,800	11. 1,852	
4. 147	1,770	1,692	2,478	12. 940	
				(a)	(b)
5. 1,877	2,855	2,868	1,143	13. 1,927	948
6. 2,273	2,401	866	89	14. 1,711	481
7. 1,459				15. 1,883	1,302
8. 2,616				16. 3,991	3,002

#### SUBTRACTION

The Exercises (1-6) on the pupil's page have been carefully graded. It will thus be possible for the teacher to find out where, i.e. at which step, the pupil is failing.

#### ORAL EXAMPLES

- Find a number which is 1 (2, 3, etc.) less than 500; less than 1,000; less than 5,000.
- Make up the next higher ten in each case: 7, 3, 5, 1, 19, 37, etc.
- Make up the next higher hundred in each case: 196, 237, 356, 978, etc.
- Make up the next higher thousand in each case: 870; 1,830; 2,500; 3,750, etc.
- How many years is it since 1900; 1914; 1820, etc.?
- How old are you? In what year were you born?
- John has 73 cigarette cards. How many is he short of 100? (27.)
- Father starts work at 9 o'clock in the morning and finishes at 6 in the evening. If he has  $1\frac{1}{2}$  hours for dinner, how many hours is he at work? ( $7\frac{1}{2}$ .)
- A cricketer scored 8 centuries and another 78 runs. How many more runs does he need to make up 1,000? (122.)

#### PICTORIAL EXERCISES

(Based on pictures, pupil's page)

- How much for (a) the mariner's compass + the watch? (10s. 5d.); etc.
- How much more for (a) the watch than the mariner's compass? (1s. 5d.); (b) the compass than the band instrument? (9d.); etc.
- Change from (a) £1; (b) 10s. after buying the watch ((a) 14s. 1d.; (b) 4s. 1d.); etc.
- Buy 3 band instruments (11s. 3d.); etc.

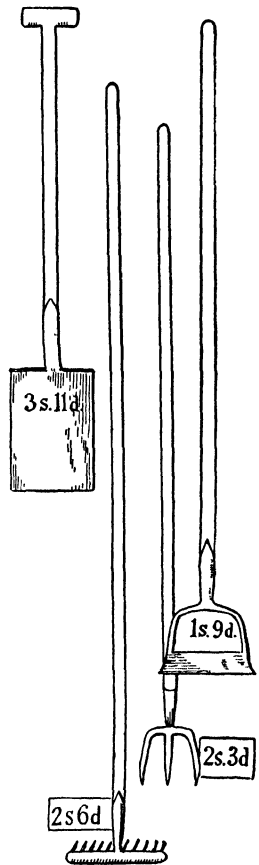
## Exercise 5

### Number. Multiplication

	(a)	(b)	(c)	(d)	(e)
1.	$\begin{array}{r} 79 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 57 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 84 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 85 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 73 \\ \times 6 \\ \hline \end{array}$
2.	$\begin{array}{r} 92 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 67 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 75 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 34 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 43 \\ \times 11 \\ \hline \end{array}$
3.	$\begin{array}{r} 976 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 284 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 895 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 466 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 675 \\ \times 6 \\ \hline \end{array}$
4.	$\begin{array}{r} 293 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 442 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 453 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 369 \\ \times 11 \\ \hline \end{array}$	$\begin{array}{r} 357 \\ \times 12 \\ \hline \end{array}$
5.	$\begin{array}{r} 483 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 286 \\ \times 12 \\ \hline \end{array}$	$\begin{array}{r} 597 \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 396 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 275 \\ \times 11 \\ \hline \end{array}$
6.	$\begin{array}{r} 437 \\ \times 11 \\ \hline \end{array}$	$\begin{array}{r} 395 \\ \times 12 \\ \hline \end{array}$	$\begin{array}{r} 476 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 387 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 789 \\ \times 6 \\ \hline \end{array}$
7.	$\begin{array}{r} 1,236 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 1,345 \\ \times 2 \\ \hline \end{array}$	$\begin{array}{r} 1,052 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 1,096 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 987 \\ \times 5 \\ \hline \end{array}$

### MULTIPLICATION BY 10, 20, 30, ETC.

8.	$\begin{array}{r} 53 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 74 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 97 \\ \times 20 \\ \hline \end{array}$	$\begin{array}{r} 58 \\ \times 30 \\ \hline \end{array}$	$\begin{array}{r} 67 \\ \times 40 \\ \hline \end{array}$
9.	$\begin{array}{r} 79 \\ \times 50 \\ \hline \end{array}$	$\begin{array}{r} 83 \\ \times 60 \\ \hline \end{array}$	$\begin{array}{r} 43 \\ \times 70 \\ \hline \end{array}$	$\begin{array}{r} 36 \\ \times 80 \\ \hline \end{array}$	$\begin{array}{r} 27 \\ \times 90 \\ \hline \end{array}$
10.	$\begin{array}{r} 350 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 270 \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 126 \\ \times 20 \\ \hline \end{array}$	$\begin{array}{r} 119 \\ \times 30 \\ \hline \end{array}$	$\begin{array}{r} 117 \\ \times 40 \\ \hline \end{array}$



11. How many shillings are there in £2, £3, £4, £5, £10, £8, £9 (twenties)?
12. How many hundredweights (cwt.) are there in 7 tons, 9 tons, 5 tons, 10 tons (twenties)?
13. How many minutes are there in 2 hours, 5 hours, 12 hours, 17 hours, 21 hours (sixties)?
14. How many pence are there in 3 half-crowns, 7 half-crowns, 12 half-crowns, 19 half-crowns (thirties)?
15. How many florins are there in £4, £7, £9, £6, £8, £10 (tens)?
16. Find the product of three hundred and seventy-nine and twelve.
17. What are nine times five hundred and nine?
18. Multiply two hundred and twelve by nine.
19. Find twenty times one hundred and seventy-nine.
20. Find the product of thirty-three and ninety.

## Exercise 5

### Number. Multiplication

#### ANSWERS

(a)	(b)	(c)	(d)	(e)	
1. 158	171	336	425	438	11. 40; 60; 80; 100; 200; 160; 180
2. 644	536	675	340	473	12. 140; 180; 100; 200
3. 1,952	852	3,580	2,330	4,050	13. 120; 300; 720; 1,020; 1,260
4. 2,051	3,536	4,077	4,059	4,284	14. 90; 210; 360; 570
5. 4,347	3,432	2,985	3,168	3,025	15. 40; 70; 90; 60; 80; 100
6. 4,807	4,740	4,284	2,709	4,734	16. 4,548
7. 3,708	2,690	4,208	3,288	4,935	17. 4,581
8. 530	740	1,940	1,740	2,680	18. 1,908
9. 3,950	4,980	3,010	2,880	2,430	19. 3,580
10. 3,500	2,700	2,520	3,570	4,680	20. 2,970

#### A. NUMBER. MULTIPLICATION. TWO FIGURES IN THE MULTIPLIER

##### 1. Multiplication by a ten.

(a) 10 times. 37, 26, 55, 49, etc.

(b) 20 times. 33, 19, 57, 38, etc.

(c) 30 times. 23, 46, 55, 19, etc.

(d) 40 times, 50 times, 60 times, 70 times, 80 times.  
23, 32, 43, etc.

##### 2. Blackboard Work. Multiplication by tens and any unit. Commence multiplying by the tens figure. This follows on naturally from blackboard example (1). Then multiply by the units figure and add the partial products together.

##### 3. Multiplication applied to reduction (one step only).

Use table items previously learnt, as: 16 oz. = 1 lb.; 24 hr. = 1 day; 36 inches = 1 yard; 1 gross = 144; 21 shillings = 1 guinea.

##### *Blackboard Work.*

1.	H. T. U.	
	2 7	
×	2 0	
	5 4 0	
2.	H. T. U.	
	5 9	
×	2 1	
	11 8 0	(59 × 20)
+	5 9	(59 × 1)
	12 3 9	(59 × 21)

#### B. PICTORIAL EXERCISES

(Based on pictures, pupil's page)

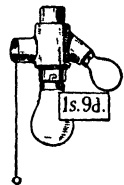
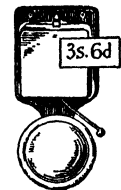
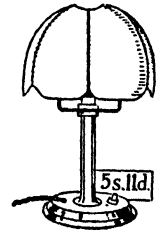
- How much altogether for the scholar's set of gardening tools? (10s. 5d.); etc.
- How much more for the spade than (a) the hoe? (2s. 2d.); (b) the rake? (1s. 5d.); etc.
- Change from £1 after buying (a) the set (9s. 7d.); (b) the spade and weed tool (13s. 10d.); etc.
- Buy 3 rakes (7s. 6d.); 4 spades (15s. 8d.); etc.

(5a)

## Exercise 6

### Number. Long Multiplication

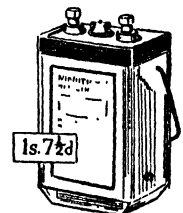
	(a)	(b)	(c)	(d)	(e)
1.	$\begin{array}{r} 57 \\ \times 14 \\ \hline \end{array}$	$\times 15$	$\times 16$	$\times 17$	$\times 18$
2.	$\begin{array}{r} 75 \\ \times 21 \\ \hline \end{array}$	$\times 22$	$\times 23$	$\times 24$	$\times 25$
3.	$\begin{array}{r} 76 \\ \times 26 \\ \hline \end{array}$	$\times 27$	$\times 28$	$\times 29$	$\times 31$
4.	$\begin{array}{r} 93 \\ \times 32 \\ \hline \end{array}$	$\times 33$	$\times 34$	$\times 35$	$\times 36$
5.	$\begin{array}{r} 65 \\ \times 73 \\ \hline \end{array}$	$\times 45$	$\times 29$	$\times 37$	$\times 49$
6.	$\begin{array}{r} 123 \\ \times 15 \\ \hline \end{array}$	$\times 18$	$\times 17$	$\times 19$	$\times 16$
7.	$\begin{array}{r} 112 \\ \times 27 \\ \hline \end{array}$	$\times 29$	$\times 36$	$\times 41$	$\times 43$
8.	$\begin{array}{r} 125 \\ \times 37 \\ \hline \end{array}$	$\times 43$	$\times 29$	$\times 18$	$\times 16$



9. How many ounces in 39 lb.; 73 lb.; 89 lb.; 55 lb.; 80 lb.?
10. How many hours in 23 days; 32 days; 75 days; 96 days; 83 days?
11. Change to shillings: 72 guineas, 112 guineas, 223 guineas, 94 guineas.
12. Change to inches: 15 yards; 27 yards; 38 yards; 112 yards.
13. How many are there in 29 gross; 23 gross; 28 gross; 19 gross?
14. Find the product of one hundred and thirty-seven and nineteen.
15. Multiply two hundred and eight by twenty-one.
16. Find the number which is thirty times thirty-seven.
17. How far will a motor travel in 17 hours at the rate of 35 miles per hour?

Write answers only in the next three sums:

18. (a)  $3 \times 4 \times 5 \times 6$ ; (b)  $2 \times 5 \times 8 \times 7$ .
19. (a)  $4 \times 10 \times 3 \times 2$ ; (b)  $4 \times 5 \times 6 \times 7$ .
20. (a)  $7 \times 8 \times 2 \times 10$ ; (b)  $5 \times 2 \times 30 \times 3$ .





## Exercise 6

### Number. Long Multiplication

#### ANSWERS

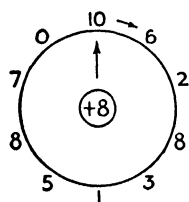
(a)	(b)	(c)	(d)	(e)	
1. 798	585	672	901	1,170	11. 1,512; 2,352; 4,683; 1,974
2. 1,571	836	1,035	1,296	1,650	12. 540; 972; 1,368; 4,032
3. 1,976	2,214	2,380	2,581	2,821	13. 4,176; 3,312; 4,032; 2,736
4. 2,976	3,135	2,924	2,730	2,484	14. 2,603
5. 4,745	4,005	2,784	3,071	2,401	15. 4,368
6. 1,845	3,888	3,757	2,964	3,632	16. 1,110
7. 3,024	3,654	3,924	4,387	4,687	17. 595 miles
8. 4,625	4,558	3,393	3,870	4,400	18. (a) 360; (b) 560.
9. 624; 1,168; 1,424; 880; 1,280					19. (a) 240; (b) 840
10. 552; 768; 1,800; 2,304; 1,992					20. (a) 1,120; (b) 900

#### PICTORIAL EXERCISES

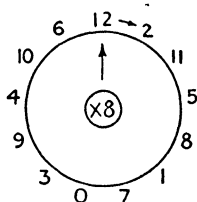
(Based on pictures, pupil's page)

- Buy any 2 of the articles; any 3.
- Find the cost of all four articles. (12s. 9½d.) Change from £1. (7s. 2½d.)
- How much more for the table lamp than (a) the bell? (2s. 5d.); (b) the two-way holder? (4s. 2d.); (c) the accumulator? (4s. 3½d.).
- Change from £1 after buying any one of the articles. (4 answers.)
- Buy 3 accumulators. (4s. 10½d.) Change from £1. (15s. 1½d.)

#### TABLE WORK (NUMBER)



Addition



Multiplication

*Addition and Subtraction.* Any number from 1–10 may occupy the inner ring.

*Multiplication and Division.* Any number from 1–12 may occupy the inner ring.

*Changing pence to s. d.* Use the division ring with 12 in the inner ring for this purpose.

*Examples on the Rings:*

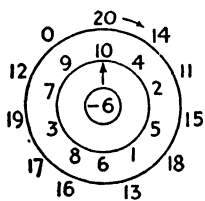
*Addition.* 10 + 6 (16); 16 + 2 (18); 18 + 8 (26); etc.

*Multiplication.* 12 × 8 (96); 11 × 8 (88), etc.; (12 × 8) + 3 (99); (11 + 8) + 9 (97); etc.

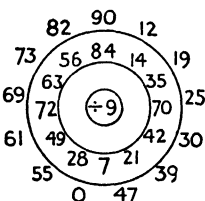
*Subtraction.* 20 – 6 (14); 14 – 6 (8); 11 – 6 (5), etc.; 20 – 10 (10); 14 – 4 (10); 11 – 2 (9); etc.

*Division.* 90 ÷ 9 (10); 12 ÷ 9 (1 and 3 R), etc.; 84 ÷ 9 (9 and 3 R); etc.

*Money.* 90d. (7s. 6d.); 12d. (1s.); etc.



Subtraction



Division

## Exercise 7

### Number. Division

	(a)	(b)	(c)	(d)	(e)
1.	9 $\overline{)327}$	10 $\overline{)450}$	8 $\overline{)329}$	5 $\overline{)575}$	7 $\overline{)352}$
2.	3 $\overline{)365}$	7 $\overline{)776}$	3 $\overline{)157}$	4 $\overline{)361}$	8 $\overline{)721}$
3.	4 $\overline{)109}$	9 $\overline{)909}$	8 $\overline{)927}$	7 $\overline{)856}$	6 $\overline{)731}$
4.	9 $\overline{)1,089}$	12 $\overline{)2,536}$	11 $\overline{)2,446}$	9 $\overline{)3,099}$	5 $\overline{)2,260}$
5.	6 $\overline{)3,172}$	5 $\overline{)2,800}$	7 $\overline{)3,256}$	8 $\overline{)4,089}$	12 $\overline{)3,472}$
6.	5 $\overline{)4,321}$	3 $\overline{)1,440}$	4 $\overline{)3,126}$	11 $\overline{)3,046}$	12 $\overline{)3,672}$
7.	2 $\overline{)2,436}$	3 $\overline{)3,476}$	4 $\overline{)4,816}$	3 $\overline{)4,440}$	2 $\overline{)3,758}$
8.	3 $\overline{)3,617}$	4 $\overline{)4,937}$	3 $\overline{)4,516}$	2 $\overline{)3,718}$	4 $\overline{)5,000}$
9.	10 $\overline{)70}$	10 $\overline{)80}$	10 $\overline{)90}$	10 $\overline{)100}$	10 $\overline{)120}$
10.	10 $\overline{)700}$	10 $\overline{)1,000}$	10 $\overline{)3,000}$	10 $\overline{)4,000}$	10 $\overline{)5,000}$
11.	10 $\overline{)691}$	10 $\overline{)734}$	10 $\overline{)956}$	10 $\overline{)1,329}$	10 $\overline{)2,731}$
12.	20 $\overline{)40}$	20 $\overline{)420}$	20 $\overline{)735}$	20 $\overline{)845}$	20 $\overline{)1,475}$
13.	30 $\overline{)690}$	30 $\overline{)1,024}$	30 $\overline{)2,164}$	30 $\overline{)4,731}$	40 $\overline{)3,156}$
14.	60 $\overline{)3,660}$	50 $\overline{)4,560}$	40 $\overline{)4,891}$	50 $\overline{)4,061}$	30 $\overline{)4,281}$

15. Find  $\frac{1}{2}$  of: 38; 372; 3,714; 44; 454; 4,554.
16. Find  $\frac{1}{4}$  of: 96; 980; 3,520; 4,504; 3,000; 5,000.
17. Find  $\frac{1}{8}$  of: 104; 1,024; 1,336; 4,216; 4,992; 5,000.
18. Change to £. s.: 80s.; 120s.; 126s.; 347s.; 495s.; 900s. (twenties).
19. Change to hours: 120 minutes, 240 minutes, 360 minutes, 480 minutes (sixties).
20. Change to tons and cwt.: 25 cwt., 37 cwt., 47 cwt., 119 cwt., 175 cwt. (twenties).
21. Divide three hundred and seventy-five by twelve.
22. How many nines are there in one thousand and eight?
23. Share 1,350 marbles amongst 16 boys and 14 girls. How many for each?
24. Divide one thousand three hundred and eighty by sixty.

## Exercise 7

### Number. Division

#### ANSWERS

	(a)	(b)	(c)	(d)	(e)
1.	36 (3 R)	45	41 (1 R)	115	50 (2 R)
2.	121 (2 R)	110 (6 R)	52 (1 R)	90 (1 R)	90 (1 R)
3.	27 (1 R)	101	115 (7 R)	122 (2 R)	121 (5 R)
4.	121	211 (4 R)	222 (4 R)	344 (3 R)	452
5.	528 (4 R)	560	465 (1 R)	511 (1 R)	289 (4 R)
6.	864 (1 R)	480	781 (2 R)	276 (10 R)	306
7.	1,218	1,158 (2 R)	1,204	1,480	1,879
8.	1,205 (2 R)	1,234 (1 R)	1,505 (1 R)	1,859	1,250
9.	7	8	9	10	12
10.	70	100	300	400	500
11.	69 (1 R)	73 (4 R)	95 (6 R)	132 (9 R)	273 (1 R)
12.	2	21	36 (15 R)	42 (5 R)	73 (15 R)
13.	23	34 (4 R)	72 (4 R)	157 (21 R)	78 (36 R)
14.	61	91 (10 R)	122 (11 R)	81 (11 R)	142 (21 R)

15. 19; 186; 1,857; 22; 227; 2,277.

16. 24; 245; 880; 1,126; 750; 1,250.

17. 13; 128; 167; 527; 624; 625.

18. £4; £6; £6. 6s.; £17. 7s.; £24. 15s.; £45.

19. 2; 4; 6; 8 hours.

20. 1 ton 5 cwt.; 1 ton 17 cwt.; 2 tons 7 cwt.; 5 tons 19 cwt.;  
8 tons 15 cwt.

21. 31 (3 R).      22. 112.      23. 45.      24. 23.

#### SIMPLE DIVISION

Dividends will now include numbers up to 5,000. Divisors will not exceed 12 except in the case of a complete number of ten, as: 30, 40, etc.

Short division by 20, 30, etc.

$$\begin{array}{r}
 \text{Th H T. U.} \\
 3'0 \overline{) 342'6} \\
 \underline{114} \quad 6 \text{ R}
 \end{array}$$

This is merely a case of 3 *tens* into 342 *tens* — 6 units, the quotient being 114 and 6 units over.

Graded exercises have been set on the pupil's page. The first step is: *tens only* to be divided by a *ten*, as:

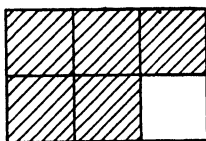
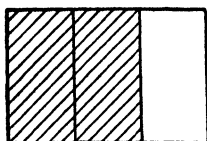
$$\begin{array}{r}
 1'0 \overline{) 7'0} \\
 \underline{7}
 \end{array}
 ; \quad
 \begin{array}{r}
 2'0 \overline{) 60'0} \\
 \underline{30}
 \end{array}$$

*Note:* (a) There is no remainder difficulty here, i.e. in the first step.

(b) This work is preparatory to long division which will be introduced at a later stage.

## Exercise 8

### Thirds and Sixths



WHOLE					
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$			
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

1. Into how many equal parts has the first oblong been divided? What is each part called? How many of these parts make a whole?
2. What part of the first oblong has been shaded? If I cut away the shaded part, what part is left?  $1 - \frac{2}{3} = ?$ .
3. Draw an oblong 4 inches by 3 inches. Draw lines to show how many square inches there are in the oblong.
  - (a) Shade  $\frac{1}{3}$  blue.  $\frac{1}{3}$  of 12 square inches = ? square inches.
  - (b) Shade  $\frac{2}{3}$  red.  $\frac{2}{3}$  of 12 square inches = ? square inches.
4. (a)  $\frac{1}{3}$  of 12s. = ?; (b)  $\frac{1}{3}$  of 1 yard = ?; (c)  $\frac{1}{3}$  of £1 = ?; (d)  $\frac{1}{3}$  of 1 hour = ?.
5. (a)  $\frac{2}{3}$  of 9s. = ?; (b)  $\frac{2}{3}$  of 1 foot = ?; (c)  $\frac{2}{3}$  of 1 guinea = ?; (d)  $\frac{2}{3}$  of 24 hours = ?.
6. Now look at the second oblong above. What is each part called? How many of these parts make a whole? What part has been shaded? What part is left?  $1 - \frac{5}{6} = ?$ .
7. If I cut away the unshaded part, what part is left?  $1 - \frac{1}{6} = ?$ .
8. (a)  $1 - \frac{4}{6} = ?$ ; (b)  $1 - \frac{3}{6} = ?$ ; (c)  $1 - \frac{2}{6} = ?$ ; (d)  $\frac{1}{6} + \frac{2}{6} = ?$ ;  $\frac{3}{6} + \frac{2}{6} = ?$ .
9. Fill in the missing figures after looking at picture three (third oblong) above.
  - (a)  $\frac{2}{6} = \frac{?}{3}$ ; (b)  $\frac{4}{6} = \frac{?}{3}$ ; (c)  $\frac{3}{6} = \frac{?}{6}$ .
10. Show, by a drawing, the number of square inches in an oblong 4 inches long and 3 inches wide. Shade  $\frac{1}{6}$  red;  $\frac{1}{2}$  blue; and  $\frac{1}{3}$  yellow.
11. (a)  $\frac{1}{6}$  of 12 square inches; (b)  $\frac{2}{3}$  of 12 square inches; (c)  $\frac{5}{6}$  of 12 square inches.
12. (a)  $\frac{1}{6}$  of £1 = ?; (b)  $\frac{1}{6}$  of 1 yard = ?; (c)  $\frac{5}{6}$  of 1 hour = ?; (d)  $\frac{5}{6}$  of 24 hours = ?.
13. (a)  $\frac{1}{6} + \frac{2}{6} = ?$ ; (b)  $\frac{1}{3} + \frac{1}{6} = ?$ ; (c)  $\frac{1}{2} + \frac{1}{6} = ?$ ; (d)  $\frac{2}{3} + \frac{1}{6} = ?$ .
14. (a)  $\frac{2}{3} - \frac{1}{3} = ?$ ; (b)  $\frac{5}{6} - \frac{1}{6} = ?$ ; (c)  $\frac{1}{2} - \frac{1}{3} = ?$ ; (d)  $\frac{2}{3} - \frac{1}{6} = ?$ .
15. (a)  $\frac{1}{4}$  of 1 guinea = ?; (b)  $\frac{3}{8}$  of £1 = ?; (c)  $\frac{3}{4}$  of 1 hour = ?.

## Exercise 8

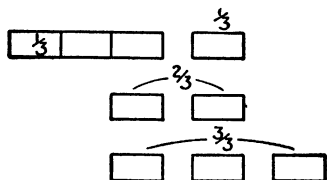
### Thirds and Sixths

#### ANSWERS

1. Three; a third.
2.  $\frac{2}{3}$ ;  $\frac{1}{3}$ .
3. (a) 4 sq. in.; (b) 8 sq. in.
4. (a) 4s.; (b) 1 ft.; (c) 6s. 8d.; (d) 20 min.
5. (a) 6s.; (b) 8 in.; (c) 14s.; (d) 16 hr.
6.  $\frac{5}{6}$  shaded;  $\frac{1}{6}$  left.
7.  $\frac{5}{6}$ .
8. (a)  $\frac{2}{3}$ ; (b)  $\frac{2}{3}$ ; (c)  $\frac{4}{6}$ ; (d)  $\frac{2}{3}$ ; (e)  $\frac{5}{6}$ .
9.  $\frac{2}{3} = \frac{1}{3}$ ;  $\frac{4}{6} = \frac{2}{3}$ ;  $\frac{2}{3} = \frac{1}{3}$ .
10. —.
11. (a) 2 sq. in.; (b) 8 sq. in.; (c) 10 sq. in.
12. (a) 3s. 4d.; (b) 6 in.; (c) 50 min.; (d) 20 hr.
13. (a)  $\frac{1}{2}$ ; (b)  $\frac{1}{2}$ ; (c)  $\frac{2}{3}$ ; (d)  $\frac{5}{6}$ .
14. (a)  $\frac{1}{3}$ ; (b)  $\frac{2}{3}$ ; (c)  $\frac{1}{6}$ ; (d)  $\frac{1}{2}$ .
15. (a) 5s. 3d.; (b) 7s. 6d.; (c) 45 min.

#### EASY FRACTIONS

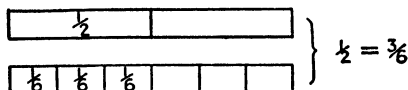
1. Practical Work: Cutting or tearing paper, shading rectangles, etc.
  - (a) *Revise*. Halves, Fourths, and Eighths. For exercises, see page 41a, Book II.
  - (b) *New Work*. Thirds and Sixths.
  - (c) *Easy Addition*. Thirds and Sixths.



$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

$$\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{3}{3} = 1; \frac{1}{3} + \frac{2}{3} = \frac{3}{3} = 1.$$

- (d) Show by a drawing that (a)  $\frac{1}{2} = \frac{3}{6}$ ;  $\frac{2}{3} = \frac{4}{6}$ ;  $\frac{2}{4} = \frac{1}{2}$ ;  $\frac{4}{8} = \frac{1}{2}$ ; etc.



#### 2. Oral Exercises:

- (a) Mother had  $3\frac{1}{2}$  cakes. She used  $2\frac{1}{2}$ . How many were left? (1.)
- (b) Give  $\frac{1}{3}$  of a cake to each of 6 boys. How many cakes left out of 4? (2.)
- (c) We have 4 apples.  $2\frac{5}{6}$  are eaten. How many left? ( $1\frac{1}{6}$ .)

#### 3. Exercises on a paper ruler showing *thirds* and *sixths*. Each child should make a ruler.

- (a)  $1\frac{1}{3} + \frac{2}{3}$ ; (b)  $2\frac{2}{3} + \frac{2}{3}$ ; (c)  $1\frac{1}{3} + 2\frac{2}{3} + 1\frac{1}{3}$ ; (d)  $3 - \frac{2}{3}$ ;  $2 - 1\frac{1}{3}$ ; etc.
- (b)  $1\frac{1}{3} \times 2$ ; (b)  $1\frac{2}{3} \times 2$ ; (c)  $2\frac{1}{3} \times 3$ ; etc.
- (c) Addition, Subtraction, and Multiplication using *sixths*.

4. Fractional values:  $\frac{1}{3}$  of 6s.;  $\frac{2}{3}$  of 6s.;  $\frac{1}{6}$ ,  $\frac{2}{6}$ ,  $\frac{3}{6}$ ,  $\frac{4}{6}$ ,  $\frac{5}{6}$  of 1 hour (60 min.); etc.

## Exercise 9

### Revision

1. (a)  $4,005 - 2,329$ ; (b) £5. 0s. 0d. — £2. 17s. 10d.; £1. 5s.  $\div 3$ .
  2. Divide 3,750 by (a) 3; (b) 5; (c) 9; (d) 12; (e) 20; (f) 60.
  3. Multiply 127 by (a) 4; (b) 6; (c) 8; (d) 15; (e) 21.
  4. Find (a)  $\frac{1}{3}$ ; (b)  $\frac{2}{3}$ ; (c)  $\frac{1}{4}$ ; (d)  $\frac{3}{4}$  of 1,260.
  5. £1. 12s.  $3\frac{1}{2}d.$  + 17s. 9d. + £1. 11s.  $4\frac{1}{2}d.$  + 19s. 8d.
  6. Multiply 7s. 9d. by (a) 3; (b) 7; (c) 9; (d) 12.
  7. Divide £5. 0s. 0d. by (a) 4; (b) 6; (c) 8; (d) 12.
  8. Find (a)  $\frac{1}{8}$ ; (b)  $\frac{3}{8}$ ; (c)  $\frac{1}{6}$ ; (d)  $\frac{5}{6}$  of £4. 16s.
  9. (a) 18 gross — 18 dozen; (b) 3 guineas — 12 half-crowns.
  10. (a) 184 articles at  $1\frac{1}{2}d.$  each; (b) 100 articles at 10 for 3d.
  11. (a)  $1\frac{1}{2}$  lb. of bacon at 1s. 3d. a lb. +  $1\frac{1}{4}$  lb. of butter at 1s. 6d. a lb.; change from 5s. = ?.
  12. (a)  $5\frac{1}{2}$  lb. —  $3\frac{1}{4}$  lb.; (b) 720 inches = ? feet; = ? yards.
  13. (a)  $\frac{1}{6} + \frac{5}{6}$ ; (b)  $\frac{1}{4} + \frac{1}{2}$ ; (c)  $\frac{1}{3} + \frac{1}{6}$ ; (d)  $\frac{1}{2} - \frac{1}{3}$ ; (e)  $\frac{3}{4} - \frac{5}{8}$ .
- 
14. Find the difference between £1. 13s. 9d. and 29 sixpences.
  15.  $\frac{1}{8}$  of a sum of money is 1s.  $11\frac{1}{2}d.$  What is the sum of money?
  16. The distance all round a square is 52 inches. How long is each side in feet and inches.
  17. The milkman has 320 customers who each take 1 pint of milk. How many gallons will he need to serve them?
  18. The bus started on its journey at 2.45 and finished at 3.25. How many minutes did it take?
  19. Draw a rectangle 5 inches by 3 inches. How many square inches are there in it? Now draw a rectangle twice as big and say how many square inches there are in it.
  20. Change (a) to pence, 3s. 5d.; (b) to pence, 33 farthings; (c) to £. s., 151 shillings.
  21. (a)  $\frac{2}{3}$  of 1 hour = ?; (b)  $\frac{5}{6}$  of 30s. = ?; (c)  $\frac{5}{8}$  of 1 lb. = ?.

## Exercise 9

### Revision

#### ANSWERS

1. (a) 1,676; (b) £2. 2s. 2d.; (c) 8s. 4d.
2. (a) 1,250; (b) 750; (c) 416 (6 R);  
(d) 312 (6 R); (e) 187 (10 R); (f) 62 (30 R).
3. (a) 508; (b) 762; (c) 1,016;  
(d) 1,905; (e) 2,667.
4. (a) 420; (b) 840; (c) 315; (d) 945.
5. £5. 1s. 1d.
6. (a) £1. 3s. 3d.; (b) £2. 14s. 3d.;  
(c) £3. 9s. 9d.; (d) £4. 13s.
7. (a) £1. 5s.; (b) 16s. 8d.; (c) 12s. 6d.;  
(d) 8s. 4d.
8. (a) 12s.; (b) £1. 16s.; (c) 16s.; (d) £4.
9. (a) 2,376; (b) £1. 13s.
10. (a) £1. 3s.; (b) 2s. 6d.
11. (a) 3s. 9d.; (b) 1s. 3d.
12. (a)  $2\frac{1}{4}$  lb.; (b) 60 ft.; 20 yd.
13. (a) 1; (b)  $\frac{3}{4}$ ; (c)  $\frac{1}{2}$ ; (d)  $\frac{1}{3}$ ; (e)  $\frac{1}{8}$ .
14. 19s. 3d.
15. 15s. 8d.
16. 1 ft. 1 in.
17. 40 gall.
18. 40 min.
19. 15 sq. in.; 60 sq. in.
20. (a) 41d.; (b)  $8\frac{1}{4}$ d.; (c) £7. 11s.
21. (a) 40 min.; (b) £1. 5s.;  
(c) 10 oz.

#### MISCELLANEOUS ORAL REVISION EXERCISES

1. A toy engine costs 1s. 6d. The rails, signals, and station cost 3 times as much. What must we pay for the lot? (6s.)
2. A boy was born in 1929. In what year will he be 11 years of age? (1940.)
3. A boy loses 57 cigarette cards out of 100. How many has he left? (43.)
4. What time does father start work in a morning? What time does he finish for dinner? How many hours is he at work in the morning? (—)
5. The paper girl delivers 3 dozen papers on Monday and 30 on Tuesday. How many altogether does she deliver on Monday and Tuesday? (66.)
6. If each paper costs 1d., how much more do the papers bring in on Monday than on Tuesday? (6d.) How much money do the papers bring in on the two days? (5s. 6d.)
7. How many oz. are there in 50 lb.? (800.)
8.  $40 + 400 + 4,000$ . (4,440.)
9. How many pints of milk in 9 gall? (72.) If each pint costs 3d., how much is the milk worth? (18s.)
10. How many cwt. bags of coal can be filled from 9 tons? (180.)
11. A boy has 36 sixpenny saving stamps on his Savings Card. How much has he saved? (18s.)
12. Father spends £1. 15s. on shilling articles. How many does he buy? (35.)

## Exercise 10

### Easy Reduction

Change to pence:

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
1.	11	19	13	17	15	23	18 halfpence.
2.	22	29	31	42	46	37	48 farthings.

Change to s. d.:

3.	17	39	18	74	52	96	100 pence.
4.	83	75	29	110	133	78	127 pence.
5.	159	175	199	187	231	227	235 pence.
6.	27	39	25	28	33	37	31 sixpences.
7.	51	63	57	72	49	55	79 threepences.

Change to £. s.:

8.	45	53	77	97	126	157	118 shillings.
9.	57	49	89	77	139	176	195 shillings.

Reduce to ounces:

10.	1 lb. 11 oz.	2 lb. 9 oz.	3 lb. 10 oz.	4 lb. 6 oz.	5 lb. 11 oz.	6 lb. 3 oz.
11.	4 lb. 9 oz.	3 lb. 2 oz.	4 lb. 11 oz.	5 lb. 13 oz.	16 lb.	21 lb. 3 oz.
12.	3½ lb.	4½ lb.	7¾ lb.	12½ lb.	19¼ lb.	9 lb. 7 oz.

Change:

	(a)	(b)	(c)	(d)	(e)
13. to quarts:	7 gall.	12 gall.	19 gall.	18 gall.	32½ gall.
14. to pints:	9 gall.	17 gall.	5½ gall.	7¼ gall.	6¾ gall.
15. to quarts:	22 pints	142 pt.	270 pt.	121 pt.	137 pt.
16. to gall.:	44 quarts	115 qt.	172 qt.	320 qt.	256 qt.
17. to gall.:	160 pints	172 pt.	218 pt.	320 pt.	117 pt.

Change:

18. to pence:	1s. 11d.	2s. 9d.	11s. 6d.	5s. 9d.	10s. 9d.
19. to shillings:	£1. 5s.	£2. 7s.	£3. 15s.	£4. 19s.	£7. 11s.



## Exercise 10

### Easy Reduction

#### ANSWERS

(a)	(b)	(c)	(d)	(e)	(f)	(g)
1. $5\frac{1}{2}d.$	$9\frac{1}{2}d.$	$6\frac{1}{2}d.$	$8\frac{1}{2}d.$	$7\frac{1}{2}d.$	$11\frac{1}{2}d.$	$9d.$
2. $5\frac{1}{4}d.$	$7\frac{1}{4}d.$	$7\frac{3}{4}d.$	$10\frac{1}{4}d.$	$11\frac{1}{2}d.$	$9\frac{1}{4}d.$	$12d.$
3. $1s. 5d.$	$3s. 3d.$	$1s. 6d.$	$6s. 2d.$	$4s. 4d.$	$8s.$	$8s. 4d.$
4. $6s. 11d.$	$6s. 3d.$	$2s. 5d.$	$9s. 2d.$	$11s. 1d.$	$6s. 6d.$	$10s. 7d.$
5. $13s. 3d.$	$14s. 7d.$	$16s. 7d.$	$15s. 7d.$	$19s. 3d.$	$18s. 11d.$	$19s. 7d.$
6. $13s. 6d.$	$19s. 6d.$	$12s. 6d.$	$14s. 0d.$	$16s. 6d.$	$18s. 6d.$	$15s. 6d.$
7. $12s. 9d.$	$15s. 9d.$	$14s. 3d.$	$18s. 0d.$	$12s. 3d.$	$13s. 9d.$	$19s. 9d.$
8. $\pounds 2. 5s.$	$\pounds 2. 13s.$	$\pounds 3. 17s.$	$\pounds 4. 17s.$	$\pounds 6. 6s.$	$\pounds 7. 17s.$	$\pounds 5. 18s.$
9. $\pounds 2. 17s.$	$\pounds 2. 9s.$	$\pounds 4. 9s.$	$\pounds 3. 17s.$	$\pounds 6. 19s.$	$\pounds 8. 16s.$	$\pounds 9. 15s.$
10. 27 oz.	41 oz.	58 oz.	70 oz.	91 oz.	99 oz.	
11. 73 oz.	50 oz.	75 oz.	93 oz.	256 oz.	339 oz.	
12. 52 oz.	72 oz.	124 oz.	200 oz.	308 oz.	151 oz.	
13. 28 qt.	48 qt.	76 qt.	72 qt.	130 qt.		
14. 72 pt.	136 pt.	44 pt.	58 pt.	54 pt.		
15. 11 qt.	71 qt.	135 qt.	$60\frac{1}{2}$ qt.	$68\frac{1}{2}$ qt.		
16. 11 gall.	$28\frac{3}{4}$ gall.	43 gall.	80 gall.	64 gall.		
17. 20 gall.	$21\frac{1}{2}$ gall.	$27\frac{1}{2}$ gall.	40 gall.	$14\frac{5}{8}$ gall.		
18. 23d.	33d.	138d.	69d.	129d.		
19. 25s.	47s.	75s.	99s.	151s.		

#### PRACTICAL WORK

- Money:** Grouping halfpence and farthings to show pence; grouping pence to show *s. d.*; grouping shillings to show *£. s.*, etc.; and vice versa.
- Weight:** Weighing bags of sand, lumps of metal, etc., in lb. oz., and giving answer in oz.
- Capacity:** Exercises bringing in the use of gall., quart, and pint measure. Capacity of a jam-jar, school ink-jar, etc.

#### TABLES

**Money:** Pence and shilling tables will now be gradually dropped. The twelves table ( $12d. = 1s.$ ) and the twenties table ( $20s. = \pounds 1$ ) will be used instead.

**Weight:**  $16 \text{ oz.} = 1 \text{ lb.}$ ;  $8 \text{ oz.} = \frac{1}{2} \text{ lb.}$ ;  $4 \text{ oz.} = \frac{1}{4} \text{ lb.}$ ;  $2 \text{ oz.} = \frac{1}{8} \text{ lb.}$

**Capacity:**  $2 \text{ pints} = 1 \text{ qt.}$ ;  $4 \text{ qt.} = 1 \text{ gall.}$ ;  $8 \text{ pt.} = 1 \text{ gall.}$ ;  $2 \text{ qt.} = \frac{1}{2} \text{ gall.}$ ;  $1 \text{ qt.} = \frac{1}{4} \text{ gall.}$ ;  $1 \text{ pt.} = \frac{1}{8} \text{ gall.}$

(Note: Such items as  $2 \text{ oz.} = \frac{1}{8} \text{ lb.}$  will be needed when expressing remainders in upward reduction.)

#### EASY REDUCTION

**Downward:** An application of multiplication (long and short).

**Upward:** An application of division (short). Care is needed with "labels" here.

**Easy Reduction:** Continued on page 11a.

## Exercise 11

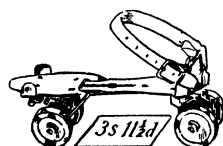
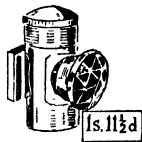
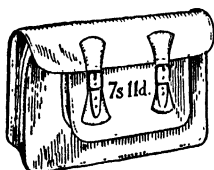
### Money. Addition and Subtraction

#### A. ADDITION

(a)			(b)			(c)			(d)			(e)		
£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1. 19	6		13	10		15	5½		12	5½		17	4½	
3	9		14	6		3	7½		3	9½		18	5½	
8	11		15	9		2	9		13	2½		19	5½	
<hr/>			<hr/>			<hr/>			<hr/>			<hr/>		
2. 1 12	3		2 11	5		1 15	11		13	5½		14	7¾	
3	9		8	9		15	9		12	7¾		13	8¾	
14	6		15	7		14	10½		19	6½		16	9¾	
<hr/>			<hr/>			<hr/>			<hr/>			<hr/>		
3. 2 3	6		4 12	4		17 8	9		24 2	7		1 18	6½	
4 17	11		7 3	6		1 3	11½		13	8¼		14	9½	
9	10		1 16	9		17	8½		15	9		15	7½	
3	8	6	1 12	3		11	9		2 11	7¼		13	11½	
<hr/>			<hr/>			<hr/>			<hr/>			<hr/>		
4. 19 12	6		21 13	9		12 18	7½		27 5	6½		7 9	5½	
11 17	9		19 11	6		13 15	1½		8 7	4½		12 19	8¾	
1 18	6		2 13	11		9 17	6¼		11 17	7¾		6 13	5½	
1 13	4		1 17	8		3 11	8¼		6 11	8¼		23 17	8¾	
<hr/>			<hr/>			<hr/>			<hr/>			<hr/>		

#### B. SUBTRACTION

£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
5. 13	15	9	15	17	4	21	19	8	17	11	10	15	9	11
12	13	8	11	9	9	16	12	11	14	15	8	11	13	7
<hr/>			<hr/>			<hr/>			<hr/>			<hr/>		
6. 12	7	5	22	6	9	33	8	10	42	9	7	17	8½	
9	13	8	18	14	10	29	19	11	33	18	8	3	9¾	
<hr/>			<hr/>			<hr/>			<hr/>			<hr/>		
7. 32	17	6	42	15	5	31	17	3	47	13	9	1 17	7¼	
25	18	9	37	16	8	24	18	7	42	18	11	19	8½	
<hr/>			<hr/>			<hr/>			<hr/>			<hr/>		
8. 27	13	5	32	17	3	43	18	1	48	12	3	1 13	5½	
9	14	6	9	19	5	7	19	11	8	13	4	17	6¾	
<hr/>			<hr/>			<hr/>			<hr/>			<hr/>		
9. 38	4	9	41	13	9	40	0	0	42	13	7	5 12	3½	
19	5	10	27	14	8	17	13	9	18	14	10	1 13	4½	
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## Exercise 11

### Money. Addition and Subtraction

#### ANSWERS

A															
(a)			(b)			(c)			(d)			(e)			
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1.	1	12	2	2	4	1	1	10		1	9	5	2	15	3½
2.	2	10	6	3	15	9	3	6	6½	2	5	7½	2	5	2¼
3.	10	19	9	15	4	10	20	2	2	28	3	7½	4	2	11
4.	35	2	1	45	16	10	40	2	11½	54	2	2¾	51	0	4

B															
A				B				C				D			
£	s.	d.		£	s.	d.		£	s.	d.		£	s.	d.	
5.	1	2	1	4	7	7		5	6	9		2	16	2	
6.	2	13	9	3	11	11		3	8	11			13	10 <sup>3</sup> / <sub>4</sub>	
7.	6	18	9	4	18	9		6	18	8		4	14	10 <sup>1</sup> / <sub>2</sub>	
8.	17	18	11	22	17	10		35	18	2		39	18	11	
9.	18	18	11	13	19	1		22	6	3		23	18	9	

Money to £50. When large sums of money are paid it is usual to make payment by means of Bank Notes, e.g. £20 note, £10 note, £5 note. By means of imitation notes and coins, money should be revised and extended to £50. Practical work, as in Book II, should be the order.

#### EASY REDUCTION

Practical work and the written form should go on together.

##### *Blackboard Work*

Ex. 1. Change to s. d. 297 pence.

$$\begin{array}{r} d. \\ 12 \overline{) 297} \\ \underline{24s. \ 9d.} \quad (\text{£}1. \ 4s. \ 9d.) \end{array}$$

Ex. 2. Change to oz. 9 lb. 13 oz.

$$\begin{array}{r} 9 \\ 16 \\ \underline{144} \\ 13 \\ \underline{157} \text{ oz.} \end{array}$$

#### PICTORIAL EXERCISES

(Based on pictures, pupil's page)

1. Buy the bag and the skates. (11s. 10½d.) Change from £1. (8s. 1½d.); etc.
2. How much more for the bag than the lamp? (5s. 11½d.); etc.
3. Buy 5 torches. Change from £1. (7s. 3½d.; 12s. 8½d.); etc.

#### ORAL WORK

1. What is the value of ten £5 notes? (£50); five £10 notes? (£50).
2. Total of one £5 note, two £10 notes, three £1 notes, and six 10s. notes. (£31.)
3. Total value of one £5 note, six £1 notes, and 8 half-crowns. (£12.)

## Exercise 12

### Money. Multiplication and Division

#### A. MULTIPLICATION

	(a)	(b)	(c)	(d)	(e)
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1.	$\begin{array}{r} 6 \text{ } 4 \\ \times 11 \\ \hline \end{array}$	$\begin{array}{r} 7 \text{ } 6 \\ \times 12 \\ \hline \end{array}$	$\begin{array}{r} 9 \text{ } 4 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 15 \text{ } 3 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 10 \text{ } 7\frac{1}{2} \\ \times 5 \\ \hline \end{array}$
2.	$\begin{array}{r} 7 \text{ } 2\frac{1}{2} \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 17 \text{ } 5\frac{1}{2} \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 19 \text{ } 3\frac{1}{4} \\ \times 10 \\ \hline \end{array}$	$\begin{array}{r} 15 \text{ } 4\frac{3}{4} \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 13 \text{ } 4\frac{1}{2} \\ \times 9 \\ \hline \end{array}$
3.	$\begin{array}{r} 1 \text{ } 3 \text{ } 4 \\ \times 4 \\ \hline \end{array}$	$\begin{array}{r} 1 \text{ } 5 \text{ } 6\frac{1}{2} \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} 1 \text{ } 2 \text{ } 2\frac{1}{2} \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 1 \text{ } 3 \text{ } 5\frac{1}{4} \\ \times 5 \\ \hline \end{array}$	$\begin{array}{r} 2 \text{ } 7 \text{ } 7 \\ \times 6 \\ \hline \end{array}$
4.	$\begin{array}{r} 8 \text{ } 3 \text{ } 3\frac{1}{2} \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 7 \text{ } 2 \text{ } 1\frac{1}{2} \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} 4 \text{ } 3 \text{ } 6 \\ \times 12 \\ \hline \end{array}$	$\begin{array}{r} 10 \text{ } 7\frac{1}{2} \\ \times 11 \\ \hline \end{array}$	$\begin{array}{r} 17 \text{ } 11\frac{1}{2} \\ \times 8 \\ \hline \end{array}$
5.	$\begin{array}{r} 1 \text{ } 3 \text{ } 7 \\ \times 8 \\ \hline \end{array}$	$\begin{array}{r} 2 \text{ } 2 \text{ } 9 \\ \times 9 \\ \hline \end{array}$	$\begin{array}{r} 3 \text{ } 3 \text{ } 7 \\ \times 6 \\ \hline \end{array}$	$\begin{array}{r} 1 \text{ } 3 \text{ } 9 \\ \times 12 \\ \hline \end{array}$	$\begin{array}{r} 19 \text{ } 4\frac{1}{2} \\ \times 12 \\ \hline \end{array}$

#### B. DIVISION

	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
6. 2	$\overline{) 8 \text{ } 12 \text{ } 6}$	3	$\overline{) 18 \text{ } 5 \text{ } 0}$	4	$\overline{) 12 \text{ } 17 \text{ } 4}$
7. 6	$\overline{) 1 \text{ } 17 \text{ } 0}$	7	$\overline{) 1 \text{ } 16 \text{ } 2}$	8	$\overline{) 9 \text{ } 6 \text{ } 0}$
8. 6	$\overline{) 8 \text{ } 0 \text{ } 0}$	7	$\overline{) 9 \text{ } 2 \text{ } 7}$	9	$\overline{) 19 \text{ } 10 \text{ } 9}$
9. 9	$\overline{) 1 \text{ } 4 \text{ } 2\frac{1}{2}}$	10	$\overline{) 1 \text{ } 4 \text{ } 7}$	7	$\overline{) 1 \text{ } 1 \text{ } 8\frac{3}{4}}$
10. 9	$\overline{) 49 \text{ } 5 \text{ } 6}$	8	$\overline{) 35 \text{ } 15 \text{ } 4}$	5	$\overline{) 1 \text{ } 3 \text{ } 6\frac{1}{2}}$
				11	$\overline{) 1 \text{ } 4 \text{ } 0\frac{3}{4}}$
				10	$\overline{) 15 \text{ } 5}$
				9	$\overline{) 14 \text{ } 5\frac{1}{2}}$
				11	$\overline{) 1 \text{ } 10 \text{ } 8\frac{1}{2}}$
				8	$\overline{) 43 \text{ } 10 \text{ } 8}$

#### C. MISCELLANEOUS

11. Find the sum of £12. 3s. 7½d., 5 guineas, and three £5 notes.
12. What is the difference between £40. 3s. 7d. and £20. 2s. 9d.?
13. Find the product of £1. 2s. 6d. and 9.
14. Divide £11. 4s. 7d. by 10.
15. Find the sum of three £10 notes, seven 10s. notes, and 6 half-crowns.
16. After spending £1. 12s. 6d. and £2. 13s. 9d., I had 7 guineas left. How much had I at first?
17. How much short of £40 is the sum of £10. 13s. 7d. and £15. 12s. 9½d.?
18. Share £43. 15s. 4d. equally among 5 men and 3 women. How much for each person?

## Exercise 12

### Money. Multiplication and Division

#### ANSWERS

##### A

	(a)	(b)	(c)	(d)	(e)
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1.	3 9 8	4 10 0	3 14 8	6 17 3	2 13 1½
2.	2 17 8	7 17 1½	9 12 8½	5 7 9½	6 0 4½
3.	4 13 4	3 16 7½	9 19 10½	5 17 2½	14 5 6
4.	48 19 9	49 14 10½	50 2 0	5 16 10½	7 3 8
5.	9 8 6	19 4 9	19 1 6	14 5 0	11 12 6

##### B

	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
6.	4 6 3	6 1 8	3 4 4	2 3 3	1 6½
7.	6 2	5 2	1 3 3	2 3 5	1 7½
8.	1 6 8	1 6 1	1 8 4	3 9 1	2 9½
9.	2 8¼	2 5½	3 1¼	4 8½	2 2¼
10.	5 9 6	4 9 5	2 7 2	6 6 4	5 8 10

##### C

11. £32. 8s. 7½d.    12. £20. 0s. 10d.    13. £10. 2s. 6d.    14. £1. 2s. 5½d.  
 15. £34. 5s.    16. £11. 13s. 3d.    17. £13. 13s. 7½d.    18. £5. 9s. 5d.

#### MONEY. ORAL EXERCISES

- 2s. 6d. + 2s. 6d. + 1s. 7½d. (6s. 7½d.)
- ½ dozen cups and saucers at 1s. 6d. the cup and saucer. (9s.)
- Change from £1 after spending 17s. 3½d. (2s. 8½d.)
- 7½ hours' work at 1s. 6d. an hr. (11s. 3d.)
- 2 qt. 1 pt. milk at 6d. a qt. (1s. 3d.)
- 1 oz. of tobacco costs 9½d. What will ¼ lb. cost? (3s. 2d.)
- 119 penny stamps. (9s. 11d.)
- 5 inches of wire at 2s. 6d. a foot. (1s. 0½d.)
- 12 railway tickets cost 17s. How much for 1? (1s. 5d.)
- 21 National Savings Stamps (6d.). (10s. 6d.)
- 1¼ lb. at 1½d. an oz. (3s. 6d.)
- ⅓ of £2. 2s. (3s. 6d.)

## Exercise 13

### Length and Scale. Practical Work`

1. Draw a line as long as the sum of lines AB and CD.

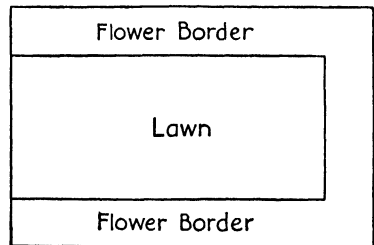
A ————— B      C ————— D

2. Measure the length and width of your teacher's table in feet and inches. Find the difference between the length and the width. How far is it all round the table?
3. My table at home is 4 feet 6 inches long and 2 feet 9 inches wide. What is the difference between the length and the width? How far is it all round?
4. Change to inches: (a) 1 ft. 9 in.; (b) 3 ft. 5 in.; (c) 4 ft. 9 in.; (d) 5 ft. 7 in.; (e) 7 ft. 11 in.; (f) 10 ft. 5 in.; (g) 12 ft. 9 in.
5. Change to feet and inches: (a) 25 in.; (b) 39 in.; (c) 57 in.; (d) 64 in.; (e) 79 in.; (f) 87 in.; (g) 119 in.
6. Change first to feet, and then to inches: (a) 3 yd.; (b) 3 yd. 1 ft.; (c) 4 yd. 2 ft.; (d) 6 yd.; (e) 7 yd. 1 ft.; (f) 8 yd. 2 ft.
7. (a) How tall are you in feet and inches? (b) in inches? (c) Who is the taller, you or your friend? By how many inches?
8. (a) John is 3 ft. 11 in. tall. How many inches is that? (b) Tom is 4 ft.  $1\frac{1}{2}$  in. tall. How many inches is that? (c) How much taller is Tom than John?
9. If  $\frac{1}{4}$  inch stands for 1 mile, find the length represented by the line AB.

A ————— B

10. The drawing shows a garden. If  $\frac{1}{8}$  of an inch stands for 1 yard, find (a) the length of the garden; (b) the width of the garden. (c) How far is it all round the garden? Give answer (c) in feet.

11. How many feet is it all round the lawn?
12. How wide (a) in yards; (b) in feet, is the flower border?
13. How far across is a halfpenny? A straight line of halfpennies touching one another totals 3 shillings. How long is the line (a) in feet? (b) in yards?



14. If line AB stands for 1 yard, what length will line CD stand for?

A ————— B

C ————— D

15. On a certain map, 1 inch stands for 25 miles. How many miles are represented by (a)  $\frac{1}{4}$  inch; (b)  $1\frac{1}{2}$  inches; (c)  $2\frac{3}{4}$  inches?

## Exercise 13

### Length and Scale. Practical Work

#### ANSWERS

1. Line,  $3\frac{5}{8}$  in.
2. —.
3. 1 ft. 9 in.; 4 yd. 2 ft. 6 in.
4. (a) 21; (b) 41; (c) 57; (d) 67; (e) 95;  
(f) 125; (g) 153 inches.
5. (a) 2 ft. 1 in.; (b) 3 ft. 3 in.; (c) 4 ft.  
9 in.; (d) 5 ft. 4 in.; (e) 6 ft. 7 in.;  
(f) 7 ft. 3 in.; (g) 9 ft. 11 in.
6. (a) 9 ft.; 108 in.; (b) 10 ft.; 120 in.;  
(c) 14 ft.; 168 in.; (d) 18 ft.; 216  
in.; (e) 22 ft.; 264 in.; (f) 26 ft.;  
312 in.
7. (a) —; (b) —.
8. (a) 47 in.; (b)  $49\frac{1}{2}$  in.; (c)  $2\frac{1}{2}$  in.
9. 11 miles.
10. (a) 15 yd.; (b) 10 yd.; (c) 50 yd.  
or 150 ft.
11. 114 feet.
12. (a) 2 yd.; (b) 6 ft.
13. (a) 6 ft.; (b) 2 yd.
14. 3 yards.
15. (a)  $6\frac{1}{2}$  ml.; (b)  $37\frac{1}{2}$  ml.; (c)  $68\frac{3}{4}$  ml.

#### PRACTICAL WORK

1. *Length.* Yards, feet, and inches. Estimation followed by testing.
  - (a) Length and width of exercise book to nearest quarter inch; difference between length and width; distance round.
  - (b) Height and width of class-room door; difference between height and width; distance round.
  - (c) Measuring distance by means of units already known or previously found:  
(a) Span; (b) Foot length; (c) Stride. Testing by tape measure.
2. *Scale.* Easy work. Drawing lines, oblongs, etc. Later work—areas to scale on squared paper.

#### ORAL EXERCISES

1. Change first to feet; then to yards: (a) 108 in. (9 ft.; 3 yd.); (b) 162 in. ( $13\frac{1}{2}$  ft.; 4 yd. 1 ft. 6 in.); etc.
2. Reduce to feet; then to inches: (a) 7 yd. (21 ft.; 252 in.); 5 yd. 1 ft. (16 ft.; 192 in.); etc.
3. If  $\frac{1}{2}$  an inch represents 4d., what length will represent (a) 1s. 8d.? ( $2\frac{1}{2}$  in.); (b) 3s.? ( $4\frac{1}{2}$  in.); etc.
4. If  $\frac{1}{8}$  inch stands for 1 pint, what length will stand for (a) 1 qt.? ( $\frac{1}{4}$  inch); (b) 1 gall.? (1 in.); etc.
5. 97 halfpennies are touching, and in a line. What distance do they stretch? (2 yd. 2 ft. 1 in.); etc.
6. If  $\frac{1}{4}$  inch stands for 1 mile, what will  $2\frac{3}{4}$  in. stand for? (11 miles.)

## Exercise 14

### Money. Revision

1. Add: 13s. 8½d., 17s. 9¾d., 15s. 11½d., and 18s. 7¾d.
2. Add: £3. 18s. 3d., £4. 19s. 8d., £7. 13s. 4d., and £11. 18s. 5d.
3. (a) Take 13s. 8½d. from 19s. 7¼d.; (b) 121d. = ?
4. Take £18. 17s. 10d. from £40. 0s. 0½d.
5. (a) £1. 2s. 9d. × 11; (b) 7 chairs at 14s. 11½d. each = ?
6. (a) £13. 14s. 0d. ÷ 12; (b) one-ninth of £31. 5s. 6d.
7. 23 halfpennies + 27 pennies + 24 threehalfpence = ?
8. 7 articles at 1s. 11½d. each + 8 articles at 2s. 5½d. each = ?
9. 1½ lb. of bacon at 1s. 11d. a lb. + 2¾ lb. of butter at 1s. 6d. a lb. Change out of £1 = ?
10. 39 pennies + 5 threepences + 4 half-crowns + five 10s. notes + three £1 notes = ?
11. Buy 9 rugs at 17s. 11½d. Change out of two £5 notes = ?
12. (a) 11 cwt. of coal at 1s. 10d. per cwt.; (b) change out of £1. 10s. = ?
13. (a) 17s. 7½d. ÷ 9; (b) 179d. = ?; (c) £1. 4s. 6d. + ½ of £1. 4s. 6d.
14. Take £11. 13s. 10d. + £19. 5s. 5d. from £50.
15. (a) Spend 17s. 5½d. + 5s. 9½d. + 2s. 8d. + 12s. 9d. (b) Change from £5 note = ?.
16. (a) 12s. 6½d. × 7; (b) 12s. 6½d. ÷ 7; (c) Take answer (b) from answer (a).
17. (a) 121d. = ?; (b) 23 stamps at 1d. + 23 stamps at ½d.
18. Mother takes 3 loaves each day for 6 days. Find her bread-bill for 6 days, if each loaf costs 4d.
19. The wages of 9 boys and 1 man are £11. 4s. 2d. How much is that for each boy, if the man's wages are £4. 1s. 8d.?
20.
 

(a)	¼ lb. of chocolates at 2s. 8d. a lb.	=	s.    d.
	2 oz. of sweets at 1s. 4d. a lb.	=	
	½ lb. of creams at 1s. 10d. a lb.	=	
	Total	=	_____
			s.    d.
(b)	2½ lb. of rice at 4d. a lb.	=	
	8 lb. of sugar at 2 lb. for 4½d.	=	
	¼ stone of flour at 2s. 2d. a stone	=	
	Total	=	_____



## Exercise 14

### Money. Revision

#### ANSWERS

- |  |  |   |   |
|--|--|---|---|
| 1. £3. 6s. 1½d.                          | 6. (a) £1. 2s. 10d.<br>(b) £3. 9s. 6d. | 11. £8. 1s. 7½d.<br>£1. 18s. 4½d.                       | 16. £4. 7s. 9½d.<br>(b) 1s. 9½d.<br>(c) £4. 6s. |
| 2. £28. 9s. 8d.                          | 7. 6s. 2½d.                            | 12. (a) £1. 0s. 2d.<br>(b) 9s. 10d.                     | 17. (a) 10s. 1d.;<br>(b) 2s. 10½d.              |
| 3. (a) 5s. 10¾d.;<br>(b) 10s. 1d.        | 8. £1. 13s. 4½d.                       | 13. (a) 1s. 11½d.;<br>(b) 14s. 11d.<br>(c) £1. 16s. 9d. | 18. 6s.   |
| 4. £21. 2s. 2½d.                         | 9. 7s.; 13s.                           | 14. £19. 0s. 9d.  | 19. 15s. 10d.                                   |
| 5. (a) £12. 10s. 3d.<br>(b) £5. 4s. 8½d. | 10. £6. 4s. 6d.                        | 15. £3. 1s. 4d.   | 20. (a) 1s. 9d.;<br>(b) 2s. 10½d.               |

#### SHOPPING EXERCISES

1. 108 oranges at 1d. each. (9s.) Change from £1. (11s.)
2. 3 tons of coal at 30s. a ton. (£4. 10s.) Change from £5. (10s.)
3. 1 gross of bananas at 10d. a dozen. (10s.) Change from £1. (10s.)
4. ¾ lb. of chocolates at 3s. 4d. a lb. (2s. 6d.) Change from 10s. (7s. 6d.)
5. 3 oz. of tea at 2s. 8d. a lb. (6d.) Change from 2/6. (2s.)
6. 5 dozen at 1½d. each. (7s. 6d.) Change from 10s. (2s. 6d.)
7. 42 twopenny articles. (7s.) Change from 10s. (3s.)
8. 12 oz. at 1s. 4d. a lb. (1s.) Change from 2/6. (1s. 6d.)
9. 1 lb. at 1½d. an oz. (2s.) Change from 10s. (8s.)
10. 12 yd. at 4s. 6d. a yard. (£2. 14s.) Change from £3. (6s.)
11. 1½ lb. at 2s. 4d. a lb. (3s. 6d.) Change from 10s. (6s. 6d.)
12. 3 yd. at 1s. 4½d. a yd. (4s. 1½d.) Change from 5s. (10½d.)
13. 100 at 10 for 4d. (3s. 4d.) Change from £1. (16s. 8d.)
14. 3 articles at 10½d. each. (2s. 7½d.) Change from 10s. (7s. 4½d.)
15. ½ dozen at 5½d. each. (1s. 4½d.) Change from 2s. 6d. (1s. 1½d.)
16. 1½ dozen eggs at 1½d. each. (2s. 3d.) Change from 10s. (7s. 9d.)
17. 1½ gall. at 3d. a pint. (2s. 6d.) Change from £1. (17s. 6d.)
18. ¼ lb. tea at 3s. 4d. a lb. (10d.) Change from 2s. (1s. 2d.)

## Exercise 15

### Revision

1. (a)  $327 + 94 + 1,347 + 999$ ; (b)  $97 \times 28$ ; (c)  $3,050 - 487$ ; (d)  $12 \overline{)1,976}$ .
  2. Find (a)  $7\frac{1}{4}$  times 128; (b)  $3\frac{1}{8}$  times 12s. 6d.
  3. Find the sum of: 17s.  $3\frac{1}{2}d.$ ; 15s. 9d.; 11s.  $8\frac{3}{4}d.$ ; and 9s.  $10\frac{1}{2}d.$
  4. How many farthings are there in  $7\frac{1}{2}d. + 3\frac{1}{4}d. + 4\frac{3}{4}d.$ ?
  5. Change (a) 59s. to £. s.; (b) 105d. to s. d.; (c) 59 threepences to s. d.
  6. Change (a) 18 lb. 12 oz. to ounces; (b) 7 gall. 1 qt. to pints; (c) 11 ft. 9 in. to inches.
  7. Write down the value of (a) VII; (b) IX; (c) XVI; (d) XXX.
  8. Write in Roman Numerals: 4, 6, 15, 19, 21.
  9. (a) From 12 lb. take 5 lb. 11 oz.; (b) From 1 yard take 1 foot 9 inches.
  10. (a)  $\frac{1}{2} + \frac{1}{4}$ ; (b)  $\frac{5}{8} - \frac{1}{2}$ ; (c)  $\frac{5}{6} - \frac{1}{2}$ ; (d)  $\frac{1}{2} - \frac{1}{4}$ ; (e)  $\frac{1}{2} + \frac{3}{8}$ .
- 
- |     |  |    |    |
|-----|--|----|----|
|     |  | s. | d. |
| 11. | (a) 2 sets of wickets at 3s. 11d. a set                          | =  |    |
|     | 2 cricket balls at 2s. 9d. each                                  | =  |    |
|     | 2 bats at 12s. 9d. each  | =  |    |
|     | Total  | =  |    |
|     |  | s. | d. |
|     | (b) $\frac{1}{2}$ dozen reels of cotton at $5\frac{1}{2}d.$ each | =  |    |
|     | $\frac{1}{2}$ dozen knots of tape at 1s. 7d. a doz.              | =  |    |
|     | 2 dozen packets of needles at 2d. each                           | =  |    |
|     | Total  | =  |    |
- 
12. (a)  $4,108 - 3,009$ ; (b)  $97 \times 30$ .
  13. From £30 take £18. 12s. 6d. + £7. 13s. 9d.
  14. Add (a) the odd numbers; (b) the even numbers in: 13; 127; 200; 1,721; 1,824; 9; 1,500.
  15. How many minutes are there from (a) 10 minutes to 3 to a quarter to 4? (b) 7 minutes past 5 to 20 minutes to 6? (c) a quarter past 3 to a quarter to 4?
  16. Write in fraction form: (a) three-quarters; (b) one-half; (c) two-thirds; (d) five-eighths; (e) five-sixths.
  17. A motor travels at 37 miles per hour. How far will it travel from 2.30 to 4 o'clock?
  18. A grocer bought 1 gross of eggs. One in every dozen was bad. How many were sound?

## Exercise 15

### Revision

#### ANSWERS

- (a) 2,767; (b) 2,716; (c) 2,563;  
(d) 164 (8 R).
- (a) 928; (b) £1. 19s. 0 $\frac{3}{4}$ d.
- £2. 14s. 7 $\frac{3}{4}$ d.
- 62 farthings.
- (a) £2. 19s.; (b) 8s. 9d.; (c) 14s. 9d.
- (a) 300 oz.; (b) 58 pt.; (c) 141 in.
- (a) 7; (b) 9; (c) 16; (d) 30.
- IV; VI; XV; XIX; XXI.
- (a) 6 lb. 5 oz.; (b) 1 ft. 3 in.
- (a)  $\frac{3}{4}$ ; (b)  $\frac{1}{8}$ ; (c)  $\frac{1}{3}$ ; (d)  $\frac{1}{4}$ ; (e)  $\frac{7}{8}$ .
- (a) £1. 18s. 10d.; (b) 7s. 6 $\frac{1}{2}$ d.
- (a) 1,099; (b) 2,910.
- £3. 13s. 9d.
- (a) 1,870; (b) 3,524.
- (a) 55 min.; (b) 33 min.; (c) 30 min.
- $\frac{3}{4}$ ;  $\frac{1}{2}$ ;  $\frac{2}{3}$ ;  $\frac{5}{8}$ ;  $\frac{5}{6}$ .
- 55 $\frac{1}{2}$  inches.
- 132.

#### NOTATION AND SIMPLE RULES

- How many hundreds in 7,000? (70); complete hundreds in 1,739? (17).
- How many must be added to 1,975 to make up the next higher thousand? (25).
- How many 13's in 13 hundreds? (100); in 13 tens? (10).
- State the value of the 1 and the 3 in 7,153. (1 hundred; 3 units.)
- Take 1 from  $\frac{1}{4}$  of a thousand. (249.)

#### WEIGHTS AND MEASURES

- How many cwt. in 3 tons 17 cwt.? (77); in 7 tons 19 cwt.? (159).
- How many oz. in 4 lb. 3 oz.? (67); in 5 lb. 9 oz.? (89); in 7 $\frac{1}{2}$  lb.? (120).
- (a)  $\frac{1}{4}$  lb. +  $1\frac{1}{2}$  lb. +  $2\frac{3}{4}$  lb. ( $4\frac{1}{2}$  lb.); (b) 1 lb. 12 oz. + 10 oz. (2 lb. 6 oz.);  
(c) 2 lb. — 1 lb. 3 oz. (13 oz.).
- How many pints in  $1\frac{1}{4}$  gall.? (10); in 1 gall. 2 qt.? (12); in 1 gall. 1 qt. 1 pt.? (11).
- 2 qt. 1 pt. + 3 qt. 1 pt. (1 gall. 2 qt.); 1 gall. — 1 qt. 1 pt. (2 qt. 1 pt.).
- How many minutes in 2 hr.? (120);  $1\frac{1}{2}$  hr.? (90); 1 hr. 45 min.? (105).
- How many tons, cwt. in 119 cwt.? (5 tons 19 cwt.); in 133 cwt.? (6 ton 13 cwt.);  
in 97 cwt.? (4 tons 17 cwt.).
- How many lb. in 48 oz.? (3 lb.); in 24 oz.? ( $1\frac{1}{2}$  lb.); in 28 oz.? ( $1\frac{3}{4}$  lb.).
- How many gall. in 72 pt.? (9); how many qt. and pints in 11 pints? (5 qt. 1 pt.).
- How many hr. and min. in 117 min.? (1 hr. 57 min.); in 176 min? (2 hr. 56 min.).
- How many weeks and days in 37 days? (5 wk. 2 days); in 46 days? (13 wk. 5 days).
- How many ft. and in. in 117 in.? (9 ft. 9 in.); how many yd., ft., in.? (3 yd. 0 ft. 9 in.).

## Exercise 16

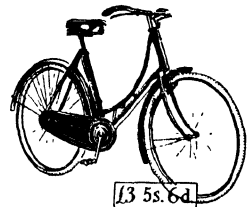
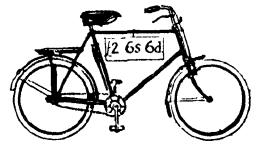
### Shopping

#### TO-DAY'S PRICES

Fresh butter, per lb.	1s. 6d.	Bacon (back), per lb.	1s. 4d.
Danish butter, per lb.	1s. 5d.	Bacon (Empire), per lb.	1s. 1d.
Margarine, per lb.	9d.	Sugar, per lb.	2½d.
New-laid eggs, per dozen	1s. 9d.	Currants, per lb.	10d.
Danish eggs, per dozen	1s. 5d.	Rice, per lb.	5d.
Tea, per lb.	2s. 10d.	Potatoes, per 14 lb.	1s. 0d.
Coffee, per lb.	2s. 8d.	Cheese, per lb.	9d.

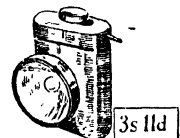
(a) How much would each bill amount to? (b) Find the change from £1 after paying each bill.

- |  |   |
|--|---|
| <p>1. ½ lb. of fresh butter.<br/>         ¼ lb. of tea.<br/>         7 lb. of potatoes.<br/>         ½ lb. of bacon (back).</p>    | <p>5. 1½ lb. of margarine.<br/>         1½ dozen eggs (Danish).<br/>         ¼ lb. of coffee.<br/>         ½ lb. of butter (Danish).</p>      |
| <p>2. 2 dozen eggs (new laid).<br/>         ¾ lb. of fresh butter.<br/>         ¾ lb. of tea.<br/>         ½ lb. of margarine.</p> | <p>6. 1½ dozen eggs (new laid).<br/>         ¾ lb. of coffee.<br/>         ¾ lb. of bacon (back).<br/>         ¼ lb. of tea.</p>              |
| <p>3. 1¼ lb. of fresh butter.<br/>         ¼ lb. of tea.<br/>         1½ lb. of cheese.<br/>         3½ lb. of potatoes.</p>       | <p>7. 2½ lb. of cheese.<br/>         14 lb. of sugar.<br/>         2½ lb. of rice.<br/>         ¼ lb. of tea.</p>                             |
| <p>4. ½ lb. of bacon (Empire).<br/>         6 lb. of sugar.<br/>         1¼ lb. of currants.<br/>         ½ lb. of rice.</p>       | <p>8. 1½ lb. of bacon (back).<br/>         1½ lb. of bacon (Empire).<br/>         ½ dozen eggs (Danish).<br/>         21 lb. of potatoes.</p> |



Fill in the missing quantities or amounts and then find the amount of the bill.

- |   |   |
|---|---|
| <p>9. ? bacon = s. d. 8<br/>         ? coffee = 2 0<br/>         ¼ lb. of tea = ?</p> | <p>10. ? cheese = s. d. 4½<br/>         ? potatoes = 6<br/>         ¼ lb. of bacon (back) = ?</p> |
|---|---|



## Exercise 16

### Shopping

#### ANSWERS

(See below for To-day's Price List)

- |  |  |
|--|--|
| 1. (a) 2s. $7\frac{1}{2}d.$ ; (b) 17s. $4\frac{1}{2}d.$  | 6. (a) 6s. 4d.; (b) 13s. 8d.   |
| 2. (a) 7s. $1\frac{1}{2}d.$ ; (b) 12s. $10\frac{1}{2}d.$ | 7. (a) 6s. $6\frac{1}{2}d.$ ; (b) 13s. $5\frac{1}{2}d.$                          |
| 3. (a) 3s. $11\frac{1}{2}d.$ ; 16s. $0\frac{1}{2}d.$     | 8. (a) 5s. 10d.; (b) 14s. 2d.  |
| 4. (a) 3s. $0\frac{1}{2}d.$ ; (b) 16s. $11\frac{1}{2}d.$ | 9. $\frac{1}{2}$ lb.; $\frac{3}{4}$ lb.; $8\frac{1}{2}d.$ ; 3s. $4\frac{1}{2}d.$ |
| 5. (a) 6s. $0\frac{1}{2}d.$ ; (b) 13s. $11\frac{1}{2}d.$ | 10. $\frac{1}{2}$ lb.; 7 lb.; 4d.; 1s. $2\frac{1}{2}d.$                          |

#### MONEY AND SHOPPING. PRACTICAL WORK

Give everyday shopping exercises bringing in the use of weights and measures as far as they are known. Set up shops of different kinds and let each pupil be customer and shop-keeper in turn. This will provide practice in the handling of money and the giving and receiving of change.

*Examples* (Suggestive):

1.  $1\frac{1}{2}$  quarts of milk (coloured water) at 3d. a pint. Pay for this with a shilling and get the correct change.
2.  $1\frac{1}{2}$  yards of ribbon (string) at 8d. a yard. Pay for this with a half-crown and get the correct change.
3. 5 lb. of potatoes at  $1\frac{1}{2}d.$  a lb. Change from 1 shilling.

#### PICTORIAL EXERCISES

(Based on pictures, pupil's page)

1. Buy a boy's bicycle, reflector, and lamp. Total cost? (£2. 11s. 2d.)
2. Change out of £3. (8s. 10d.)
3. Buy a girl's bicycle, reflector, and lamp. Total cost? (£3. 10s. 2d.)
4. Change out of £4 after paying for the articles in sum 3. (9s. 10d.)
5. How much more for (a) the lamp than the reflector? (3s. 2d.); the girl's bicycle than the boy's? (19s.).
6. Buy 2 lamps (7s. 10d.); change out of 10s. (2s. 2d.).

#### SHOPPING. PRICE LISTS

*To-day's Price List:* Prices vary in different parts of the country and from time to time in the same district. The sums on the pupil's page have been set in such a manner that they will fit in with any "price list". A board showing "To-day's Prices" should be hung in a prominent position in the classroom and the children should be instructed to work their sums, with prices based on this list.

## Exercise 17

### Number and Money. Revision

#### A. NUMBER

1. Add: 306; 2,004; and 83.
2. Take: 1,207 from 3,001.
3.  $96 \times 34$ .
4.  $1,137 \div 12$ .
5.  $374 + 374 + 374 + 374 + 374$ .
6.  $4,764 \div 12$ .
7. Multiply 378 + 372 by  $378 - 372$ .
8. Find  $\frac{1}{8}$  of  $(4,000 - 8)$ .
9.  $1,969 \div 11$ .
10.  $120 \times 36$ .
11.  $2,101 \div 9$ .
12.  $3,103 - 1,711$ .
13.  $179 + 179 + 179 + 179 + 179$ .
14.  $\frac{5}{8}$  of 1,584 +  $\frac{1}{3}$  of 1,998.
15.  $4,013 - 737$ .
16.  $376 \times 11$ .
17. How many years have passed since (a) 1066; (b) 1820?
18. In 1938 I was 54 years of age. When was I born?
19. Lead pencils are packed in boxes holding 1 gross. How many pencils are there in 2 dozen boxes?
20. Subtract in columns and rows:

8,972	7,603
<u>3,177</u>	<u>1,987</u>

#### B. MONEY

1. Add: £1. 12s. 6d.; £12. 9s. 7d.; £13. 11s. 8½d.; and 37 sixpences.
2. From £1. 12s. 7½d. take 15s. 10¾d.
3. 9s. 8d.  $\times 3\frac{1}{8}$ .
4.  $\frac{5}{8}$  of £1. 6s.
5. 39 halfpence + 79d. + 25 three-halfpence.
6. Spend 3s. 9d. + 6s. 4d. + £1. 7s. 9d. Change from £2 = ?.
7. 3½ lb. of beef at 1s. 8d. a lb.
8. 1,000 postcards at 10 a 1d.
9. 7 writing pads at 10½d. each.
10. 8d.  $\times 39$ .
11. £2. 0s. 0d. -  $\frac{3}{4}$  of £2. 0s. 0d.
12. Change (a) to farthings, 7¾d.; (b) to shillings, £7. 13s.
13. Change (a) to s. d., 39d.; (b) to £. s., 117 shillings.
14. 19½ hours' work at 5d. an hour = ?
15. £7. 3s. 6d. - £1. 2s. 9½d.
16.  $\frac{2}{3}$  of £1. 13s. 10½d.
17. Find the sum of two £10 notes, three £1 notes, seven 10s. notes, and 101d.
18. I spent 3s. 7½d., 7s. 11½d., and had 5s. 9½d. left. How much had I at first?
19. (a) 1 gross of pencils at 9d. a dozen.  
(b) 2¼ dozen eggs at 1½d. each.  
(c) 1¾ lb. of bacon at 1s. 6d. a lb.

## Exercise 17

### Number and Money. Revision

#### ANSWERS

##### A

- |             |           |               |                           |
|-------------|-----------|---------------|---------------------------|
| 1. 2,393    | 6. 397    | 11. 233 (4 R) | 16. 4,136                 |
| 2. 1,794    | 7. 4,500  | 12. 1,392     | 17. —                     |
| 3. 3,264    | 8. 499    | 13. 1,074     | 18. 1,884                 |
| 4. 94 (9 R) | 9. 179    | 14. 1,986     | 19. 3,456                 |
| 5. 1,870    | 10. 4,320 | 15. 3,276     | 20. Columns: 5,795; 5,616 |
|             |           |               | Rows: 1,369; 1,190        |

##### B

- |                           |   |
|---------------------------|---|
| 1. £28. 12s. 3½d.         | 11. 10s.                                |
| 2. 16s. 8¾d.              | 12. (a) 31 farthings; (b) 153s.         |
| 3. £1. 10s. 2½d.          | 13. (a) 3s. 3d.; (b) £5. 17s.           |
| 4. 16s. 3d.               | 14. 8s. 1½d.                            |
| 5. 11s. 4d.               | 15. £6. 0s. 8½d.                        |
| 6. £1. 17s. 10d.; 2s. 2d. | 16. £1. 2s. 7d.                         |
| 7. 5s. 10d.               | 17. £26. 18s. 5d.                       |
| 8. 8s. 4d.                | 18. 17s. 4½d.                           |
| 9. 6s. 1½d.               | 19. (a) 9s.; (b) 3s. 4½d.; (c) 2s. 7½d. |
| 10. £1. 6s.               |   |

#### PRACTICAL WORK. REVISION

##### A. LENGTH

- Find, using inches, quarter-inches, and eighths of an inch, the length of elastic needed to make a pair of garters for your own legs, allowing ½ an inch extra for each garter, for stitching.
- Measure the length of a postage stamp (use eighths); the shortest distance between your seat and your teacher's desk (yd., ft., and ins.); the length of your coat (ft. and ins.); etc.

##### B. WEIGHT

- Weigh (a) 6 reading books; (b) your boots, etc. (lb. and oz.)
- Make up the following packets of sand: (a) 2 oz.; (b) ¼ lb.; (c) ½ lb.; (d) 2 lb., etc.
- Weigh ½ lb. rice; 3½ lb. flour; 4 lb. sugar. If these things are already parcelled up, test the weights.

##### C. CAPACITY

- Find how much water (a) a tea-cup; (b) a jug will hold.
- Find how much ink the class ink-can will hold.

##### D. TIME

- Find from the classroom time-table the length of time given to the following lessons on a particular day: Music, P. T., Arithmetic, etc.
- When does playtime in the morning commence and finish?

##### E. SCALE

Draw to scale simple plans of (a) a chalk box; (b) the top of your teacher's table.

## Exercise 18

### Area. Square Inch; Square Foot; Square Yard

1. Draw a rectangle 2 inches long and  $\frac{1}{2}$  an inch wide. Draw lines to show the number of square inches it covers. Area =  $\frac{1}{2} \times 2$  square inches.
2. Draw a rectangle  $3\frac{1}{2}$  inches by 2 inches. Find its area by drawing lines. Area =  $3\frac{1}{2} \times 2$  square inches.
3. Find, by a drawing, the area of a 5-inch square of paper. Area =  $5 \times 5$  square inches.

4. Find the areas of the following oblongs (rectangles).

- (a) Length, 4 inches; width, 3 inches;
- (b) Length, 6 inches; width, 4 inches;
- (c) Length, 5 inches; width,  $2\frac{1}{2}$  inches;
- (d) Length, 12 inches; width, 7 inches.

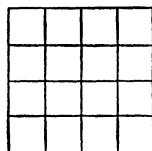


Fig. 1 (Square)

5. Figs. 1 and 2 show a square and a rectangle having equal areas. Each small square in both figures stands for 1 square foot.

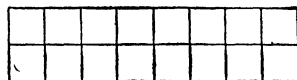


Fig. 2 (Rectangle)

- |                                       |  |
|---------------------------------------|--|
| (a) What is the length of the square? | (c) What is the length of the rectangle? |
| (b) What is its area?                 | (d) What is the width of the rectangle?  |

Area of square =  $4 \times 4$  square feet.  
= 16 square feet.

Area of rectangle =  $8 \times 2$  square feet.  
= 16 square feet.

6. Let each square in your exercise book stand for 1 square foot and draw a square covering 36 square feet. Then draw a rectangle which has the same area as the square.

Now complete (a) and (b) below.

(a)	(b)
Length of square = ?.	Length of rectangle = ?; Width of rectangle = ?.
Area of square = ?.	Area of rectangle = ?.

7. Find the area of the following rectangles: (a) 4 ft. by 3 ft.; (b) 6 ft. by 2 ft.; (c) 8 ft. by 7 ft.
8. Estimate the area of the top of your desk. Test by means of your teacher's square foot.
9. What is the area of a table top 6 feet by 4 feet?

10. Find (a) the area, in square yards, of the garden, p. 13, number 10; (b) the area, in square yards, of the grass plot (lawn); (c) the area of the border.



## Exercise 18

### Area. Square Inch; Square Foot; Square Yard

#### ANSWERS

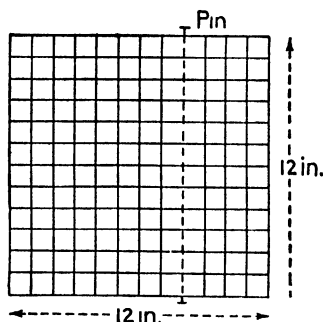
1. 1 sq. in.
2. 7 sq. in.
3. 25 sq. in.
4. (a) 12 sq. in.; (b) 24 sq. in.;  
(c)  $12\frac{1}{2}$  sq. in.; (d) 84 sq. in.
5. (a) 4 ft.; (b) 16 sq. ft.; (c) 8 ft.;  
(d) 2 ft.
6. (a)  $L = 6$  ft.; 36 sq. ft.; (b)  $L = 9$  ft. or 12 ft.;  $W = 4$  ft. or 3 ft.,  
Area = 36 sq. ft.
7. (a) 12 sq. ft.; (b) 12 sq. ft.; (c) 56 sq. ft.
8. —.
9. 24 sq. ft.
10. (a) 150 sq. yd.; (b) 78 sq. yd.; (c) 72 sq. yd.

#### PRACTICAL WORK

Revise and extend area. In Book II small areas (sq. in.) were considered. Area is the number of squares (ins., feet, etc.) in a figure. Estimate areas in sq. in. and test by means of the unit (square inch).

#### THE SQUARE FOOT AND SQUARE YARD—FOR LARGER AREAS

*Teacher's Demonstration square foot.* (See figure.)



The framework can be made of laths. At intervals of 1 inch round the framework, stick in pins. Stretch thread to connect opposite pairs of pins.

144 square inches = 1 square foot.

The demonstration square foot can be used for testing areas in either square-feet or square-inches.

*Demonstration Square Yard.* This can be made in a similar manner, the framework being 1 yard square. 9 square feet = 1 square yard.

#### DRAWING TO SCALE

1. Draw to scale (a) a square foot; (b) a square yard.
2. Draw to scale, on squared paper (1 square = 1 sq. ft.), the plan of the floor of a room 12 feet by 9 feet. Then show a carpet on the floor of the room, leaving a border of 2 foot all round. Find, by counting the squares, the area in sq. ft. of (a) the floor; (b) the carpet; (c) the border.

#### TABLE WORK

144 square ins. = 1 square foot; 9 square feet = 1 square yard.

Draw, on the classroom floor, a square foot and show, by drawing lines, that 144 sq. in. = 1 sq. ft. Then draw a square yard and, in a similar manner, show that 9 sq. ft. = 1 sq. yd.

*Note:* It is a good plan to paint in the lines with white paint and allow the drawing to remain for some time.

## Exercise 19

### Number and Notation. Addition

1. Read to your neighbour: 3,726; 109; 5,001; 7,356; 8,999; 9,197.
2. Which of the numbers in number 1 are even numbers?
3. Write what each figure stands for in each number in sum 1.
4. Read in as many ways as you can, each number in sum 1.
5. Write in figures: XXIV; XXXIX; XLVI; LXXII; XC.
6. Write in Roman Numerals: 32, 55, 79, 110, 64.
7. (a) Read: 22nd; 31st; 19th; (b) write in the shortened form: seventeenth; twenty-first; eighteenth; thirtieth; seventh.
8. What is the value of the pair of figures underlined: 172; 217; 1,729?
9.  $300 \times 10$ ;  $25 \times 100$ ;  $7 \times 1,000$ ;  $18 \times 20$ ;  $17 \times 500$ .
10. Write in figures the following numbers, and find their sum: Thirty-three; one hundred and seventeen; three hundred and nine; two thousand and twenty-nine.

Add, in columns and rows:

	(a)	(b)
11.	$73 + 56 + 121 =$	$273 + 348 + 97 =$
12.	$34 + 89 + 39 =$	$265 + 179 + 165 =$
13.	$19 + 43 + 116 =$	$137 + 269 + 371 =$
14.	$\underline{27} + \underline{19} + \underline{78} = \underline{\quad}$	$\underline{184} + \underline{138} + \underline{279} = \underline{\quad}$
15. Totals	$\underline{\quad} \quad \underline{\quad} \quad \underline{\quad} = \underline{\quad}$	Totals $\underline{\quad} \quad \underline{\quad} \quad \underline{\quad} = \underline{\quad}$

	(a)	(b)	(c)	(d)	(e)	(f)
16.	1,902	1,356	1,373	3,216	1,976	4,379
	+ 796	+ 784	+ 856	+ 715	+ 843	+ 156
	+ 2,159	+ 2,153	+ 1,119	+ 1,316	+ 2,315	+ 1,134
	+ <u>3,119</u>	+ <u>3,116</u>	+ <u>976</u>	+ <u>2,175</u>	+ <u>2,176</u>	+ <u>2,295</u>

17. Find the sum of two thousand two hundred and three, three thousand eight hundred and eleven, two thousand and six, and three hundred and sixteen.
18. How many hundreds make five thousand?
19. In one town there are three thousand and ten girls and half as many boys. How many boys and girls together are there?

## Exercise 19

### Number and Notation. Addition

#### ANSWERS

- |                                     |                                      |
|-------------------------------------|--------------------------------------|
| 1. —.                               | 11. (a) 250; (b) 718.                |
| 2. 3,726; 7,356.                    | 12. (a) 162; (b) 609.                |
| 3. $3,000 + 700 + 20 + 6$ ; etc.    | 13. (a) 178; (b) 777.                |
| 4. —.                               | 14. (a) 124; (b) 601.                |
| 5. 24, 39, 46, 72, 90.              | 15. (a) 153; 207; 354; 714;          |
| 6. XXXII, LV, LXXIX, CX, LXIV.      | (b) 859; 934; 912; 2705.             |
| 7. —.                               | 16. (a) 7,976; (b) 7,409; (c) 4,324; |
| 8. 17 tens; 17 units; 17 hundreds.  | (d) 7,422; (e) 7,310; (f) 7,964.     |
| 9. 3,000; 2,500; 7,000; 360; 8,500. | 17. 8,336.                           |
| 10. 33; 117; 309; 2,029. Sum =      | 18. 50 hundreds.                     |
| 2,488.                              | 19. 4,515.                           |

#### PRACTICAL WORK

Using millimetre squares, revise and extend notation to 9,999 along the lines previously suggested.

#### NOTATION

1. Reading numbers in different ways. (See page 2a, analysing numbers, 2.)
2. Revision and extension of Roman Notation to 500. (D.)

XX (20), XXX (30), LX (60), XC (90), C (100), CCCC (400) or CD (400).

Point out how cumbersome it would be to work sums using the Roman Notation.

3. Revise place order: 1st, 33rd, etc.
4. Numeration and Notation. (See No. 10, pupil's page.)

#### COUNTING

1. Count by 50's from 0 to 500 and backwards.
2. Count by 100's from 0 to 1,000 and backwards; then by 1,000's from 0 to 9,000 and backwards.

#### TABLE WORK

Keep up table work along lines previously suggested.

#### ORAL EXERCISES

1. (a)  $930 \div 10$  (93);  $8,500 \div 100$  (85);  $3,579 \div 100$  ( $35\frac{79}{100}$ ); etc.
2. How many complete 10's in: 157; 35; 1,239; etc.?
3. How many complete 100's in: 351; 3,176; 9,199; etc.?
4.  $36 \times 10$  (360);  $31 \times 100$  (3,100);  $99 \times 100$  (9,900);  $12 \times 30$  (360);  $127 \times 50$  (6,350); etc.

## Exercise 20

### Number. Subtraction and Multiplication

#### A. SUBTRACTION

Work the following sums and check your answers:

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
1.	$\begin{array}{r} 7,453 \\ - 4,948 \\ \hline \end{array}$	$\begin{array}{r} 6,253 \\ - 3,296 \\ \hline \end{array}$	$\begin{array}{r} 9,870 \\ - 3,894 \\ \hline \end{array}$	$\begin{array}{r} 8,623 \\ - 989 \\ \hline \end{array}$	$\begin{array}{r} 7,111 \\ - 496 \\ \hline \end{array}$	$\begin{array}{r} 9,127 \\ - 2,018 \\ \hline \end{array}$	$\begin{array}{r} 3,001 \\ - 273 \\ \hline \end{array}$

Subtract, in columns and in rows, and check your answers:

	(a)	(b)	(c)	(d)	(e)	(f)
2. (i)	8,494	6,923	9,483	3,628	9,117	7,129
(ii)	<u>7,435</u>	<u>3,256</u>	<u>7,809</u>	<u>1,976</u>	<u>3,694</u>	<u>1,082</u>
3. (i)	7,717	7,166	5,217	2,378	9,316	6,139
(ii)	<u>3,888</u>	<u>1,749</u>	<u>1,719</u>	<u>199</u>	<u>7,887</u>	<u>4,777</u>

4. Find the difference between one thousand and one, and thirteen.
5. What must be added to one to make nine thousand?
6. Take the smallest from the greatest; one thousand three hundred and six; 1,316; four thousand and nine; 4,019.
7. (a)  $3,109 - 999$ ; (b)  $1,015 - 887$ ; (c)  $7,001 - 19$ ; (d)  $9,315 - 756$ .

#### B. MULTIPLICATION

8. Multiply 789 by (a) 4; (b) 5; (c) 6; (d) 7; (e) 8; (f) 9; (g) 11; (h) 12.

	(a)	(b)	(c)	(d)	(e)	(f)
9.	$72 \times 33$	$84 \times 37$	$95 \times 38$	$47 \times 36$	$116 \times 36$	$101 \times 18$
10.	$99 \times 87$	$93 \times 95$	$96 \times 39$	$89 \times 76$	$154 \times 56$	$197 \times 43$
11.	$573 \times 15$	$470 \times 20$	$238 \times 37$	$506 \times 18$	$190 \times 39$	$225 \times 40$
12.	$409 \times 17$	$360 \times 29$	$278 \times 32$	$205 \times 36$	$503 \times 19$	$439 \times 15$

13. Change to inches: 19 yards; 38 yards; 29 yards; 135 yards.
14. Change to ounces: 121 lb.; 137 lb.; 289 lb.; 578 lb.
15. Find the product of three hundred and seventeen and twenty-nine.
16. Find the number which is nineteen times five hundred and six.
17. How many eggs are there altogether in 4 dozen boxes, if each box holds 180?
18. A man weighs  $14\frac{1}{2}$  stones. How many lb. is that? (14 lb. = 1 stone.)
19. (a)  $(3,715 - 3,179) \times 18$ ; (b)  $(9,001 - 8,712) \times 27$ .

## Exercise 20

### Number. Subtraction and Multiplication

#### ANSWERS

#### A

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
1.	2,505	2,957	5,976	7,634	6,615	7,109	2,728
2. { Columns:	1,059	3,667	1,674	1,652	5,423	6,047	
{ Rows: (i)		1,571		5,855		1,988	
{   (ii)		4,179		5,833		2,612	
3. { Columns:	3,829	5,417	3,498	2,179	1,429	1,362	
{ Rows: (i)		551		2,839		3,177	
{   (ii)		2,139		1,520		3,110	
4. 988.	5. 8,999.	6. 2,703.	7. (a) 2,110; (b) 128; (c) 6,982; (d) 8,559.				

#### B

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
8.	3,156	3,945	4,734	5,523	6,312	7,101	8,679	9,468
9.	2,376	3,108	3,610	1,692	4,176	1,818		
10.	8,613	8,835	3,744	6,764	8,624	8,471		
11.	8,595	9,400	8,806	9,108	7,410	9,000		
12.	6,953	10,440	8,896	7,380	9,557	6,585		
13.	684	1,368	1,044	4,860 inches.				
14.	1,936	2,192	4,624	9,248 oz.				
15.	9,193.	16. 9,614.	17. 8,640 eggs.	18. 203 lb.	19. (a) 9,648; (b) 7,803.			

### NUMBER. MULTIPLICATION. TWO FIGURES IN THE MULTIPLIER

See page 5a. (Two figures in the multiplier—tens and any unit.) Revise A. 1, 2, and 3, and blackboard work, as shown on page 5a.

#### ORAL EXERCISES. MISCELLANEOUS

- How many (a)  $\frac{1}{4}$ -lb. packets; (b) 2-oz. packets can be made up from  $3\frac{1}{2}$  lb. of pepper? ((a) 14; (b) 28.)
- How many hours in a week? (168.)
- May received, on her 9th birthday, 1 shilling for every month she had lived. How much money did she receive? (£5. 8s.)
- 12 articles cost £9. How much is that for one if the values of the articles are all equal? (15s.)
- How many complete 10's in  $27 \times 40$  (108 tens)?;  $17 \times 12$  (20 tens)?
- $54 + 76 - 80$ . (50.)
- From 1,000 take away  $80 \times 10$ . (200.)
- Find the difference between 20 tens and 20 hundreds. (1,800.)

## Exercise 21

### Simple Long Division. An Introduction

Work these sums as shown in Example 1:

(a)	(b)	(c)	(d)
1. $369 \div 3$	$639 \div 3$	$936 \div 3$	$963 \div 3$
2. $482 \div 2$	$284 \div 2$	$842 \div 2$	$824 \div 2$

Example 1

$$\begin{array}{r} 342 \\ 2 \overline{)684} \\ \underline{6} \phantom{0} \\ 8 \\ \underline{8} \\ 4 \\ \underline{4} \\ 0 \end{array}$$

Work these sums as shown in Example 2:

3. $597 \div 3$	$1,768 \div 4$	$6,265 \div 5$	$8,832 \div 6$
4. $8,904 \div 7$	$9,936 \div 8$	$7,950 \div 6$	$9,835 \div 5$

Example 2

$$\begin{array}{r} 264 \\ 3 \overline{)792} \\ \underline{6} \phantom{0} \\ 19 \\ \underline{18} \\ 12 \\ \underline{12} \\ 0 \end{array}$$

Work these sums as shown in Example 3:

5. $744 \div 8$	$649 \div 11$	$5,868 \div 9$	$2,724 \div 12$
6. $4,973 \div 12$	$6,372 \div 11$	$5,756 \div 10$	$7,136 \div 9$
7. $5,921 \div 7$	$4,732 \div 6$	$5,516 \div 8$	$4,279 \div 12$

Example 3

$$\begin{array}{r} 745 \\ 11 \overline{)8195} \\ \underline{77} \phantom{00} \\ 49 \\ \underline{44} \phantom{0} \\ 55 \\ \underline{55} \\ 0 \end{array}$$

Work these sums as shown in Example 4:

8. $900 \div 20$	$700 \div 20$	$500 \div 20$	$300 \div 20$
9. $320 \div 20$	$360 \div 20$	$380 \div 20$	$420 \div 20$
10. $330 \div 30$	$360 \div 30$	$390 \div 30$	$420 \div 30$
11. $480 \div 40$	$520 \div 40$	$600 \div 40$	$720 \div 40$
12. $660 \div 60$	$720 \div 60$	$840 \div 60$	$700 \div 50$

Example 4

$$\begin{array}{r} 17 \\ 20 \overline{)340} \\ \underline{20} \phantom{0} \\ 140 \\ \underline{140} \\ 0 \end{array}$$

Work these sums two ways as shown in Examples 5a and 5b:

13. $2,667 \div 20$	$6,349 \div 30$	$4,462 \div 40$	$5,621 \div 50$
14. $5,072 \div 20$	$9,673 \div 30$	$7,901 \div 70$	$9,000 \div 80$
15. $6,672 \div 60$	$6,214 \div 40$	$8,317 \div 60$	$7,298 \div 50$
16. $4,961 \div 30$	$7,066 \div 50$	$9,217 \div 80$	$5,276 \div 40$

Example 5a

$$\begin{array}{r} 30 \overline{)6437} \\ \underline{214} \phantom{00} \end{array} \quad 17(R)$$

Example 5b

$$\begin{array}{r} 214 \\ 30 \overline{)6437} \\ \underline{60} \phantom{00} \\ 43 \\ \underline{30} \phantom{0} \\ 137 \\ \underline{120} \phantom{0} \\ 17 \text{ over.} \end{array}$$

Work these sums as shown in Example 6:

17. $631 \div 70$	$548 \div 90$	$275 \div 30$	$147 \div 20$
18. $456 \div 90$	$326 \div 80$	$251 \div 50$	$280 \div 40$
19. $817 \div 90$	$210 \div 30$	$643 \div 80$	$420 \div 70$

Example 6

$$\begin{array}{r} 7 \\ 40 \overline{)287} \\ \underline{280} \\ 7 \text{ over.} \end{array}$$

## Exercise 21

### Simple Long Division. An Introduction

#### ANSWERS

(a)	(b)	(c)	(d)
1. 123	213	312	321
2. 241	142	421	412
3. 199	442	1,253	1,472
4. 1,272	1,242	1,325	1,967
5. 93	59	652	227
6. 414 (5 R)	579 (3 R)	575 (6 R)	792 (8 R)
7. 845 (6 R)	788 (4 R)	689 (4 R)	356 (7 R)
8. 45	35	25	15
9. 16	18	19	21
10. 11	12	13	14
11. 12	13	15	18
12. 11	12	14	14
13. 133 (7 R)	211 (19 R)	111 (22 R)	112 (21 R)
14. 253 (12 R)	322 (13 R)	112 (61 R)	112 (40 R)
15. 111 (12 R)	155 (14 R)	138 (37 R)	145 (48 R)
16. 163 (11 R)	141 (16 R)	115 (17 R)	131 (36 R)
17. 9 (1 R)	6 (8 R)	9 (5 R)	7 (7 R)
18. 5 (6 R)	4 (6 R)	5 (1 R)	7
19. 9 (7 R)	7	8 (3 R)	6

#### SIMPLE LONG DIVISION

This should be introduced as shown on the pupil's page. The same example, say  $2,331 \div 7$ , should be worked by short division and by long division, side by side, to show that the two methods are identical; long division shows all the steps.

#### *Blackboard Work*

When this has been done, the pupils should work the examples set on the pupil's page.

Long division should be set out as shown, i.e. with the figures of the quotient, in their correct places, above the figures of the dividend.

*Note:* The teacher should not rush the work in long division.

$$\begin{array}{r}
 7 \overline{) 2,331} \\
 \underline{333} \\
 333
 \end{array}
 \qquad
 \begin{array}{r}
 333 \\
 7 \overline{) 2331} \\
 \underline{21} \\
 23 \\
 \underline{21} \\
 21 \\
 \underline{21} \\
 21
 \end{array}$$

#### ORAL EXERCISES

- How many tens in 30, 40, 120, 370, etc.?
- How many twenties (thirties) in 120, 180, 240, 300, etc.?
- $180 \div 60$  (3);  $200 \div 40$  (5);  $280 \div 70$  (4); etc.
- How many £. s. in 150s.? (£7. 10s.); 175s.? (£8. 15s.); etc.

## Exercise 22

### Simple Long Division

A

(a)	(b)	(c)	(d)	(e)	(f)
1. $21 \overline{)42}$	$21 \overline{)84}$	$31 \overline{)62}$	$31 \overline{)93}$	$21 \overline{)84}$	$21 \overline{)63}$
2. $21 \overline{)441}$	$21 \overline{)882}$	$31 \overline{)651}$	$31 \overline{)992}$	$41 \overline{)861}$	$21 \overline{)693}$
3. $21 \overline{)336}$	$41 \overline{)779}$	$51 \overline{)867}$	$31 \overline{)372}$	$41 \overline{)779}$	$51 \overline{)969}$
4. $21 \overline{)483}$	$51 \overline{)612}$	$31 \overline{)682}$	$41 \overline{)451}$	$61 \overline{)854}$	$81 \overline{)972}$
5. $32 \overline{)864}$	$23 \overline{)368}$	$24 \overline{)552}$	$43 \overline{)946}$	$42 \overline{)924}$	$52 \overline{)728}$
6. $33 \overline{)396}$	$43 \overline{)559}$	$34 \overline{)510}$	$22 \overline{)528}$	$23 \overline{)759}$	$44 \overline{)968}$

B

7. $28 \overline{)112}$	$37 \overline{)185}$	$29 \overline{)145}$	$34 \overline{)272}$	$25 \overline{)225}$	$19 \overline{)133}$
8. $35 \overline{)245}$	$26 \overline{)234}$	$37 \overline{)222}$	$46 \overline{)368}$	$27 \overline{)108}$	$18 \overline{)108}$
9. $47 \overline{)329}$	$36 \overline{)288}$	$17 \overline{)153}$	$46 \overline{)414}$	$39 \overline{)312}$	$45 \overline{)360}$
10. $47 \overline{)281}$	$36 \overline{)212}$	$38 \overline{)189}$	$25 \overline{)219}$	$79 \overline{)351}$	$37 \overline{)213}$
11. $28 \overline{)103}$	$26 \overline{)123}$	$47 \overline{)321}$	$19 \overline{)151}$	$35 \overline{)269}$	$68 \overline{)551}$

C

12. $35 \overline{)2,975}$	$57 \overline{)4,902}$	$38 \overline{)2,014}$	$49 \overline{)3,626}$	$64 \overline{)4,352}$
13. $34 \overline{)2,824}$	$72 \overline{)4,201}$	$25 \overline{)1,789}$	$29 \overline{)1,219}$	$87 \overline{)5,613}$
14. $52 \overline{)932}$	$32 \overline{)771}$	$24 \overline{)384}$	$43 \overline{)511}$	$47 \overline{)981}$
15. $62 \overline{)927}$	$57 \overline{)736}$	$48 \overline{)816}$	$53 \overline{)631}$	$75 \overline{)893}$
16. $33 \overline{)1,726}$	$43 \overline{)1,119}$	$78 \overline{)3,843}$	$75 \overline{)3,164}$	$28 \overline{)2,171}$
17. $25 \overline{)1,759}$	$57 \overline{)3,106}$	$89 \overline{)8,137}$	$39 \overline{)2,371}$	$36 \overline{)2,917}$
18. $32 \overline{)437}$	$19 \overline{)1,174}$	$43 \overline{)596}$	$15 \overline{)1,297}$	$72 \overline{)819}$

19. How many yards are there in 432 inches?
20. How many days are there in 768 hours? (24 hours = 1 day.)
21. A boy had 689 cigarette pictures in sets. How many were there in each set, if he had 13 sets?
22. How many rows of cabbages can a gardener plant with 3,240 plants, if he puts 72 in a row?
23. How many boxes will be required for 1,296 eggs, if each box holds 4 dozen?



## Exercise 22

### Simple Long Division

#### ANSWERS

##### A

(a)	(b)	(c)	(d)	(e)	(f)
1. 2	4	2	3	4	3
2. 21	42	21	32	21	33
3. 16	19	17	12	19	19
4. 23	12	22	11	14	12
5. 27	16	23	22	22	14
6. 12	13	15	24	33	22

##### B

7. 4	5	5	8	9	7
8. 7	9	6	8	4	6
9. 7	8	9	9	8	8
10. 5 (46 R)	5 (32 R)	4 (37 R)	8 (19 R)	4 (35 R)	5 (28 R)
11. 3 (19 R)	4 (19 R)	6 (39 R)	7 (18 R)	7 (24 R)	8 (7 R)

##### C

(a)	(b)	(c)	(d)	(e)
12. 85	86	53	74	68
13. 83 (2 R)	58 (25 R)	71 (14 R)	42 (1 R)	64 (45 R)
14. 17 (48 R)	24 (3 R)	16	11 (38 R)	20 (41 R)
15. 14 (59 R)	12 (52 R)	17	11 (48 R)	11 (68 R)
16. 52 (10 R)	26 (1 R)	49 (21 R)	42 (14 R)	77 (15 R)
17. 70 (9 R)	54 (28 R)	91 (38 R)	60 (31 R)	81 (1 R)
18. 13 (21 R)	61 (15 R)	13 (37 R)	86 (7 R)	11 (27 R)
19. 12 yards.	20. 32 days.	21. 53.	22. 45.	23. 27 boxes.

*Note:* The examples on the pupil's page have been graded for the purpose of introducing the difficulties one at a time, as follows:

A. One or two figures in the quotient; the "expected" figure or figures.

B. One figure, after "trial", in the quotient.

C. Nos. 12 and 13. Two figures in the quotient, the first after "trial", the second "expected".

C. Nos. 14 and 15. Two figures in the quotient, the first "expected", the second after "trial".

C. Nos. 16, 17, and 18. Miscellaneous.

### PRACTICAL WORK

Using counters or used match-sticks, demonstrate the process of division.

*Examples:* (1)  $42 \div 21$ ; (2)  $441 \div 21$ .

*Ex. 1.*  $42 = 2$  groups of twenty-one.

*Ex. 2.*  $44$  tens  $\div 21 = 2$  ten groups of twenty-one ( $420$ ); this leaves  $21$  still to share;  $21 \div 21 = 1$ . And so,  $441 \div 21 = 21$ .

*Work both examples on the blackboard*

(22a)

## Exercise 23

### Revision

	(a)	(b)	(c)	(d)	(e)
1.	$\begin{array}{r} 3,009 \\ - 1,007 \\ \hline \end{array}$	$\begin{array}{r} 3,851 \\ - 2,738 \\ \hline \end{array}$	$\begin{array}{r} 3,268 \\ - 1,735 \\ \hline \end{array}$	$\begin{array}{r} 3,915 \\ - 1,636 \\ \hline \end{array}$	$\begin{array}{r} 2,323 \\ - 786 \\ \hline \end{array}$

Work the following subtraction sums and check your answers:

2.	$\begin{array}{r} 4,506 \\ - 1,379 \\ \hline \end{array}$	$\begin{array}{r} 3,000 \\ - 1,908 \\ \hline \end{array}$	$\begin{array}{r} 1,000 \\ - 19 \\ \hline \end{array}$	$\begin{array}{r} 5,000 \\ - 10 \\ \hline \end{array}$	$\begin{array}{r} 4,326 \\ - 2,577 \\ \hline \end{array}$
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Change:

(a)	(b)	(c)
3. 22 halfpence to pence.	19 farthings to pence.	79d. to s. d.
4. 143 pence to s. d.	39 sixpences to s. d.	67 threepences to s. d.
5. 7 lb. 5 oz. to oz.	37 lb. to oz.	18½ lb. to oz.
6. 29¼ gall. to qt.	19½ gall. to pints.	195 pt. to quarts.
7. 137 qt. to gall.	156 pt. to gall.	£8. 13s. to shillings.

8.	$\begin{array}{r} \text{£} \text{ s. } d. \\ 17 \text{ } 8 \\ \times 7 \\ \hline \end{array}$	$\begin{array}{r} \text{£} \text{ s. } d. \\ 12 \text{ } 9\frac{1}{2} \\ \times 11 \\ \hline \end{array}$	$\begin{array}{r} \text{£} \text{ s. } d. \\ 1 \text{ } 8 \text{ } 9 \\ \times 3 \\ \hline \end{array}$	$\begin{array}{r} \text{£} \text{ s. } d. \\ 1 \text{ } 4 \text{ } 9 \\ \times 12 \\ \hline \end{array}$	$\begin{array}{r} \text{£} \text{ s. } d. \\ 2 \text{ } 5 \text{ } 7 \\ \times 6 \\ \hline \end{array}$
----	---	---	---	--	---

9.	$\begin{array}{r} \text{s. } d. \\ 9 \text{ } 15 \text{ } 11\frac{1}{4} \\ \hline \end{array}$	$\begin{array}{r} \text{s. } d. \\ 10 \text{ } 16 \text{ } 3 \\ \hline \end{array}$	$\begin{array}{r} \text{£} \text{ s. } d. \\ 10 \text{ } 25 \text{ } 7 \text{ } 6 \\ \hline \end{array}$	$\begin{array}{r} \text{£} \text{ s. } d. \\ 12 \text{ } 1 \text{ } 8 \text{ } 6 \\ \hline \end{array}$	$\begin{array}{r} \text{£} \text{ s. } d. \\ 5 \text{ } 32 \text{ } 12 \text{ } 6 \\ \hline \end{array}$
----	--	---	--	---	--

10.	$95 \times 74$	$77 \times 66$	$138 \times 49$	$176 \times 50$	$110 \times 40$
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Subtract, in columns and in rows, and check your answers:

	(a)	(b)	(c)	(d)
11.	(i) 3,216	2,010	(i) 8,972	7,603
	(ii) <u>2,377</u>	<u>2,001</u>	(ii) <u>3,177</u>	<u>1,987</u>

12. (a)  $1,276 + 19 + 756 + 4,328$ ; (b)  $8,017 - 4,999$ ; (c)  $4,608 \div 96$ .

13. (a)  $1,259 \div 37$ ; (b)  $811 \div 68$ ; (c)  $816 \div 69$ ; (d)  $2,973 \div 34$ ; (e)  $3,176 \div 45$ .

14. (a)  $3,010 - 300$ ; (b)  $125 \times 41$ ; (c)  $896 \div 78$ .

## Exercise 23

### Revision

#### ANSWERS

(a)	(b)	(c)	(d)	(e)
1. 2,002	1,113	1,533	2,279	1,537
2. 3,127	1,092	981	4,990	1,749
3. 11 <i>d.</i>	4 $\frac{3}{4}$ <i>d.</i>	6 <i>s.</i> 7 <i>d.</i>		
4. 11 <i>s.</i> 11 <i>d.</i>	19 <i>s.</i> 6 <i>d.</i>	16 <i>s.</i> 9 <i>d.</i>		
5. 117 oz.	592 oz.	296 oz.		
6. 117 qt.	156 pt.	97 $\frac{1}{2}$ qt.		
7. 34 $\frac{1}{4}$ gall.	19 $\frac{1}{2}$ gall.	173 <i>s.</i>		
8. £6. 3 <i>s.</i> 8 <i>d.</i>	£7. 0 <i>s.</i> 8 $\frac{1}{2}$ <i>d.</i>	£4. 6 <i>s.</i> 3 <i>d.</i>	£14. 17 <i>s.</i> 0 <i>d.</i>	£13. 13 <i>s.</i> 6 <i>d.</i>
9. 1 <i>s.</i> 9 $\frac{1}{4}$ <i>d.</i>	1 <i>s.</i> 7 $\frac{1}{2}$ <i>d.</i>	£2. 10 <i>s.</i> 9 <i>d.</i>	2 <i>s.</i> 4 $\frac{1}{2}$ <i>d.</i>	£6. 10 <i>s.</i> 6 <i>d.</i>
10. 7,030	5,082	6,762	8,800	4,400

	(a)	(b)	(c)	(d)
11. { Columns:	839	9	5,795	5,616
Rows: (i)	1,206		1,369	
(ii)	376		1,190	

(a)	(b)	(c)	(d)	(e)
12. 6,379	3,018	48		
13. 34 (1 R)	11 (63 R)	11 (57 R)	87 (15 R)	70 (26 R)
14. 2,710	5,125	11 (38 R)		

#### MISCELLANEOUS ORAL REVISION EXAMPLES

- How many inches in 11 $\frac{1}{2}$  ft.? (138.)
- How many gall. and qt. in 371 quarts? (92 gall. 3 qt.)
- Spend 11*s.* 7 $\frac{1}{2}$ *d.* How much change from £1? (8*s.* 4 $\frac{1}{2}$ *d.*)
- How many halfpenny stamps for 3*s.* 1*d.*? (74.)
- How many pint bottles can be filled from 1 $\frac{1}{2}$  gall. of milk? (12.)
- Five halfpennies weigh 1 oz. Find the weight of 100 halfpennies. (1 lb. 4 oz.)
- 10 yards at 3 $\frac{1}{2}$ *d.* a yard. (2*s.* 11*d.*)
- 3 $\frac{1}{2}$ *d.* + 5 $\frac{1}{2}$ *d.* + 8 $\frac{1}{2}$ *d.* (1*s.* 5 $\frac{1}{2}$ *d.*)
- After paying 1*s.* 4*d.* for beef, 1*s.* for sausages, and 8*d.* for bacon, mother has 5*s.* 3*d.* left. How much had she at first? (8*s.* 3*d.*)
- How many days and hours in 53 hours? (2 days 5 hr.)
- Find the distance round a rectangle 6 inches by 4 $\frac{1}{2}$  inches. (1 ft. 9 in.)
- The train set out at 9.5 and arrived at 10.45. How long did it take? (1 hr. 40 min.)
- How many minutes are there from twenty minutes to three to five past three? (25 min.)
- $\frac{2}{3}$  of 6 hours. (4 hours.)
- 7 times 8 inches. (4 ft. 8 in.)

## Exercise 24

### Revision

- (a)  $8,031 - 3,456$ ; (b)  $172 \times 49$ ; (c)  $1,222 \div 34$ .
- (a)  $\pounds 1. 16s. 3d. + 12s. 11d. + 9d. + \pounds 25. 19s. 9d.$ ; (b)  $\pounds 40. 0s. 3d. - \pounds 15. 7s. 9d.$
- (a)  $15s. 9\frac{1}{2}d. \times 7$ ; (b)  $\pounds 16. 7s. 6d. \div 10$ ; (c)  $\frac{1}{8}$  of  $14s. 4d. + \frac{1}{3}$  of  $5s. 4\frac{1}{2}d.$
- 12 articles at  $1s. 9\frac{1}{2}d.$  each + 11 at  $1s. 3\frac{1}{2}d.$  each = ?.
- 120 halfpenny stamps + 120 penny stamps + 120 threehalfpenny stamps.  
Find the total value.
- Change (a) to half-pints: 7 gall. 1 pint; (b) to pence,  $17s. 6d.$ ;  
(c) to  $\frac{1}{4}$  lb.,  $96\frac{1}{2}$  lb.
- (a)  $3,001 \div 41$ ; (b)  $123 \times 57$ ; (c)  $14s. 7\frac{1}{2}d. \times 9$ .
- Add the sum of three thousand and nine and eleven hundred and seventy-six to their difference.
- How much short of  $\pounds 10$  is the difference between  $\pounds 15. 1s. 7d.$  and  $\pounds 11. 9s. 6d.$ ?
- Write in Roman Numerals: 11, 32, 90, 109, 111.
- 19 boxes each contain 180 oranges. Four and a half dozen are bad. How many are sound?
- How many halfpennies, placed side by side, will measure a distance of 4 yd. 1 ft.? Find their value in  $s. d.$
- Draw to scale, on squared paper (1 square = 1 sq. foot), the floor of a room 12 ft. by 9 ft. showing a carpet in the middle, leaving a border of 1 foot all round. Find, by counting the squares, the area in square feet of  
(a) the floor; (b) the carpet; (c) the border.
- (a)  $93 \times 87$ ; (b)  $7,315 \div 90$ ; (c)  $876 \div 72$ ; (d)  $179 \times 50$ .
- (a)  $\pounds 1. 13s. 6d. + 17s. 9d. + \pounds 5. 8s. 9d. + 1s. 0\frac{1}{2}d.$ ; (b)  $\pounds 37. 1s. 1d. - \pounds 14. 14s.$
- (a)  $13s. 4\frac{1}{2}d. \times 12$ ; (b)  $12s. 6\frac{1}{2}d. \div 7$ ; (c)  $(\pounds 1. 5s. 6d. \times 11) - \pounds 5. 5s.$
- (a)  $\frac{1}{2} + \frac{1}{4}$ ; (b)  $1 - \frac{5}{8}$ ; (c)  $\frac{1}{3} + \frac{1}{2}$ ; (d)  $\frac{1}{6} + \frac{2}{3}$ ; (e)  $\frac{1}{4} + \frac{1}{2} + \frac{1}{8}$ .
- Change (a) to oz., 17 lb. 4 oz.; (b) to quarts, 19 gall. 3 qt.
- How many minutes are there (a) from a quarter to four to ten past four;  
(b) from  $\frac{1}{4}$  past 6 to 7.15?
- A rectangle measures  $5\frac{1}{2}$  inches by 4 inches. Find (a) the distance round;  
(b) the area.
- The bus set out at 1.40 and arrived at 2.20. How long did it take?

## Exercise 24

### Revision

#### ANSWERS

1. (a) 4,575; (b) 8,428; (c) 35 (32 R).
2. (a) £28. 9s. 8d.; (b) £24. 12s. 6d.
3. (a) £5. 10s. 6½d.; (b) £1. 12s. 9d.; (c) 3s. 7d.
4. £1. 15s. 8½d.
5. £1. 10s.
6. (a) 114; (b) 210; (c) 386.
7. (a) 73 (8 R); (b) 7,011; (c) £6. 11s. 7½d.
8. 6,018.
9. £6. 7s. 11d.
10. XI; XXXII; XC; CIX; CXI.
11. 3,366.
12. 156; 6s. 6d.
13. (a) 108 sq. ft.; (b) 70 sq. ft.; (c) 38 sq. ft.
14. (a) 8,091; (b) 81 (25 R); (c) 12 (12 R); (d) 8,950.
15. (a) £8. 1s. 0½d.; (b) £22. 7s. 1d.
16. (a) £8. 0s. 6d.; (b) 1s. 9½d.; (c) £8. 15s. 6d.
17. (a) ¾; (b) ⅔; (c) ⅝; (d) ⅞; (e) ⅞.
18. (a) 276 oz.; (b) 79 quarts.
19. (a) 25 min.; (b) 60 min.
20. (a) 1 ft. 7 in.; (b) 22 sq. in.
21. 40 min.

#### MISCELLANEOUS ORAL REVISION EXAMPLES

1. How many oz. are there in 30 lb.? (480.)
2. Add: 50, 500, and 5,000. (5,550.)
3. How many gall., pints. in 97 pints? (12 gall. 1 pt.)
4. After paying 1s. 11d. for coal and 1s. for gas, mother has 3s. left. How much had she at first? (5s. 11d.)
5. May has 2s. 6d. and her brother has twice that amount. How much have they together? (7s. 6d.)
6. 5½d. + 3½d. + 10½d. (1s. 7½d.)
7. £2. 15s. + 17s. 6d. (£3. 12s. 6d.)
8. 1 lb. 11 oz. + 14 oz. (2 lb. 9 oz.)
9. 1 yard 2 ft. 6 ins. + 7 in. (2 yd. 1 in.)
10. 5 mats at 5s. 6d. each. (£1. 7s. 6d.)
11. 4s. 7d. × 5. (£1. 2s. 11d.)
12. 7 tables at £1. 12s. each. (£11. 4s.)
13. How many square feet in the floor of a room 12 ft. by 9 ft.? (108.)
14. How many 1½d. stamps for 3s. 6d.? (28.)
15. How many 2-oz. packets can be made up from 3 lb.? (24.)
16. 3 pennies weigh an oz. Find the weight of 108 pennies. (2 lb. 4 oz.)
17. 10 yd. of lace at 3d. a foot. (7s. 6d.)
18. 6 gall. of milk at 3d. a pint. (12s.)
19. 2 gross of lead pencils at 9d. a dozen. (18s.)

## Exercise 25

### Tests

#### A

1. Find the sum of: £3. 2s. 6d., £2. 7s. 9d., 10 half-crowns, and three 10s. notes.
2. (a)  $76 \times 63$ ; (b)  $3,076 \div 38$ ; (c)  $3,024 - 1,999$ ; (d)  $2,756 + 119 + 3,154 + 17$ .
3. Mother takes  $1\frac{1}{2}$  pints of milk each day for 6 days. Find the total cost at  $3\frac{1}{2}d.$  a pint.
4. £21. 13s. 4d.  $\div 10$ .
5. Share 5,292 marbles equally among 5 boys and 4 girls.

#### B

1. (a)  $\frac{2}{3}$  of £3. 16s. +  $\frac{1}{8}$  of £6. 8s. 8d.; (b)  $12s. 7\frac{1}{2}d. \times 6$ ; (c) £11. 13s. 4d. — £3. 17s. 9d.
2. How much is the sum of £3. 11s. 6d., £7. 3s. 9d., and £11. 18s. 5d. short of £50?
3. A train travels from Edinburgh to London, 392 miles, in 8 hours. How many miles per hour is that?
4. Take 1,378 from the sum of 1,250 and 1,301.
5. 11 lb. of raisins at 1s.  $1\frac{1}{2}d.$  per lb. = ?.

#### C

1. Find the total of 2 gross, 3 score,  $9\frac{1}{2}$  dozen, and eleven hundred and thirty-one.
2. (a)  $116 \times 57$ ; (b)  $5,001 - 2,374$ ; (c)  $956 \div 37$ ; (d)  $\frac{1}{3}$  of the sum of 1,125 and 720.
3. Rice is sold at  $2\frac{1}{2}d.$  per lb. Find the cost of 1 cwt. (112 lb.).
4. £2. 19s. 6d.  $\times 12$ .
5. Envelopes are sold at 25 for 2d. How much will 1,000 cost?

#### D

1. (a)  $17s. 3\frac{1}{2}d. \times 11$ ; (b) £12. 13s. 5d. — £7. 14s. 9d.; (c) £1. 16s.  $5\frac{1}{2}d. \div 5$ .
2. 11 yards at 2s.  $9\frac{1}{4}d.$  a yd. = ?.
3. A shopkeeper takes £5. 19s. 7d. on Thursday and £12. 19s. 4d. on Friday. How much does he take on Saturday if his takings for the 3 days are £41. 1s. 7d.?
4. Divide £17. 15s. equally among 12 men.
5. Divide the sum of 1,137, 1,127, and 957 by 53.

## Exercise 25

### Tests

#### ANSWERS

##### A

1. £8. 5s. 3d.    2. (a) 4,788; (b) 80 (36 R); (c) 1,025; (d) 6,046.    3. 2s. 7½d.  
4. £2. 3s. 4d.    5. 588.

##### B

1. (a) £3. 6s. 9d.; (b) £3. 15s. 9d.; (c) £7. 15s. 7d.    2. £27. 6s. 4d.    3. 49 m.p.h.  
4. 1,173.    5. 12s. 4½d.

##### C

1. 1,593.    2. (a) 6,612; (b) 2,627; (c) 25 (31 R); (d) 615.    3. £1. 3s. 4d.    4. £35. 14s.  
5. 6s. 8d.

##### D

1. (a) £9. 10s. 2½d.; (b) £4. 18s. 8d.; (c) 7s. 3½d.    2. £1. 10s. 5¼d.    3. £22. 2s. 8d.  
4. £1. 9s. 7d.    5. 60 (41 R).

#### MENTAL TEST

(Write answers only — 10 minutes allowed)

1. 1s. 4d. + 3s. 8d. + 1s. 10d. (6s. 10d.)
2. 8 yd. at 3½d. per yd. (2s. 4d.)
3. Tea is bought at 2s. a lb. and sold at 2s. 8d. a lb. Find the profit on 8 lb. (5s. 4d.)
4. I travel for 6 hours at 30 m.p.h. What distance do I cover? (180 miles.)
5. 2 tons of coal cost £5. How much per ton is that? (£2. 10s.)
6. How many yd. of ribbon in 12 pieces each 9 in. long? (3.)
7. 1½ lb. sweets at ½d. an oz. (1s.)
8. ⅔ of 6 gall. (4 gall.)
9. How many pints in 10½ gall.? (84.)
10. 480 sixpenny tickets. (£12.)

#### TABLE TEST

(Dictated at intervals of 5 seconds)

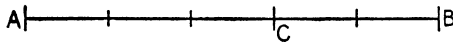

1.  $9 \times 5$ .    2.  $121 \div 11$ .    3. 119d. to s. d.    4. 8s. 7d. = d.    5. ½ sq. ft. to sq. in.
6. 3 lb. 10 oz. to oz.    7. 2 days 1 hr. to hr.    8. 5 tons 12 cwt. to cwt.
9. 3 ft. 7 in. to in.    10. 137s. to £. s.

## Exercise 26

### Easy Fractions

								ONE WHOLE	1
								HALVES	$\frac{1}{2}$
								QUARTERS	$\frac{1}{4}$
								EIGHTHS	$\frac{1}{8}$

												ONE WHOLE	1
												THIRDS	$\frac{1}{3}$
												SIXTHS	$\frac{1}{6}$
												TWELFTHS	$\frac{1}{12}$

- Take a strip of paper and fold it to show thirds, sixths, and twelfths. Colour  $\frac{1}{3}$  red,  $\frac{1}{6}$  blue, and  $\frac{1}{12}$  yellow.
- (a) How many sixths in  $\frac{1}{3}$ ? (b) How many twelfths in  $\frac{1}{3}$ ? (c) How many twelfths in  $\frac{2}{3}$ ? (d) How many twelfths in  $\frac{2}{3} + \frac{1}{12}$ ? (e) How many twelfths in  $\frac{1}{3} + \frac{1}{12}$ ?
- (a)  $1 - \frac{2}{3} = ?$ ; (b)  $1 - \frac{5}{6} = ?$ ; (c)  $1 - \frac{7}{12} = ?$ ; (d)  $\frac{1}{3} + \frac{1}{12} = ?$ ; (e)  $\frac{7}{12} + \frac{4}{12} = ?$ ; (f)  $\frac{1}{3} + \frac{1}{6} = ?$ .
- Write as twelfths:  $\frac{2}{3}$ ;  $\frac{1}{6}$ ;  $\frac{1}{3}$ ;  $\frac{5}{6}$ ;  $\frac{1}{2}$ ;  $\frac{1}{4}$ ;  $\frac{3}{4}$ .
- Find on your ruler,  $2\frac{5}{12}$  inches. How many twelfths altogether?
- How many twelfths in  $1\frac{1}{2}$ ;  $1\frac{5}{12}$ ;  $1\frac{1}{12}$ ; 2?
- How many inches and twelfths in  $\frac{13}{12}$  inches? Now write, in another way,  $\frac{4}{3}$ ,  $\frac{11}{6}$ ,  $\frac{19}{12}$ ,  $\frac{24}{12}$ ,  $\frac{27}{12}$ .
- Find (a)  $\frac{1}{2}$  of £1; (b)  $\frac{1}{4}$  of 16 gall.; (c)  $\frac{2}{3}$  of 1 guinea; (d)  $\frac{3}{8}$  of 24 hours; (e)  $\frac{5}{6}$  of 60 minutes.
- Find (a)  $\frac{1}{2}$ ; (b)  $\frac{1}{4}$ ; (c)  $\frac{1}{3}$ ; (d)  $\frac{1}{8}$ ; (e)  $\frac{1}{6}$ ; (f)  $\frac{1}{12}$  of £1.
- What part of 1 hour is (a) 30 minutes; (b) 15 min.; (c) 10 min.; (d) 5 min.; (e) 20 min.?
- What part of the line AB is AC? 
- Draw a line  $3\frac{1}{2}$  inches long. Mark off the half-inches. How many? What part of the line is (a) one half-inch; (b) 5 half-inches?
- Into how many equal parts has the oblong been divided? What part is shaded? What part is left unshaded? 
- Write in another form: (a)  $\frac{2}{3}$ ;  $\frac{6}{9}$ ;  $\frac{5}{9}$ ;  $\frac{17}{9}$ ; (b)  $\frac{6}{6}$ ;  $\frac{12}{6}$ ;  $\frac{8}{6}$ ;  $\frac{11}{6}$ ;  $\frac{13}{6}$ .
- (a)  $\frac{7}{12} + \frac{1}{12}$ ; (b)  $\frac{5}{12} + \frac{7}{12}$ ; (c)  $\frac{1}{12} + \frac{11}{12}$ ; (d)  $\frac{11}{12} + \frac{7}{12}$ ; (e)  $\frac{1}{12} + \frac{5}{12} + \frac{7}{12}$ .
- (a)  $\frac{2}{3} + \frac{1}{12}$ ; (b)  $\frac{1}{2} + \frac{1}{12}$ ; (c)  $\frac{1}{4} + \frac{1}{12}$ ; (d)  $\frac{3}{4} + \frac{1}{12}$ ; (e)  $\frac{5}{6} + \frac{1}{12}$ .
- (a)  $\frac{11}{12} - \frac{1}{12}$ ; (b)  $\frac{5}{12} - \frac{1}{12}$ ; (c)  $\frac{1}{6} - \frac{1}{12}$ ; (d)  $\frac{1}{3} - \frac{1}{12}$ ; (e)  $\frac{3}{4} - \frac{5}{12}$ .
- Find (a)  $\frac{1}{3}$ ; (b)  $\frac{1}{4}$ ; (c)  $\frac{1}{9}$  of £15. 15s.
- What part of £1 is (a) 4s.; (b) 12s.; (c) 16s.?



## Exercise 26

### Easy Fractions

#### ANSWERS

1. —.
2. (a)  $\frac{2}{6}$ ; (b)  $\frac{4}{12}$ ; (c)  $\frac{8}{12}$ ; (d)  $\frac{8}{12}$ ; (e)  $\frac{5}{12}$ .
3. (a)  $\frac{1}{3}$ ; (b)  $\frac{1}{6}$ ; (c)  $\frac{5}{12}$ ; (d)  $\frac{5}{12}$ ; (e)  $\frac{11}{12}$ ; (f)  $\frac{3}{6}$ .
4.  $\frac{8}{12}$ ;  $\frac{2}{12}$ ;  $\frac{4}{12}$ ;  $\frac{10}{12}$ ;  $\frac{6}{12}$ ;  $\frac{3}{12}$ ;  $\frac{9}{12}$ .
5. 29 twelfths.
6. 18, 17, 13, 24 twelfths.
7.  $1\frac{1}{12}$ ;  $1\frac{1}{3}$ ;  $1\frac{5}{6}$ ;  $1\frac{7}{12}$ ; 2;  $2\frac{1}{4}$  ( $2\frac{3}{12}$ ).
8. (a) 10s.; (b) 4 gall.; (c) 14s.; (d) 9 hr.; (e) 50 min.
9. (a) 10s.; (b) 5s.; (c) 6s. 8d.; (d) 2s. 6d.; (e) 3s. 4d.; (f) 1s. 8d.
10. (a)  $\frac{1}{2}$ ; (b)  $\frac{1}{4}$ ; (c)  $\frac{1}{8}$ ; (d)  $\frac{1}{12}$ ; (e)  $\frac{1}{3}$ .
11.  $\frac{3}{6}$ .
12. 7 h. in.; (a)  $\frac{1}{7}$ ; (b)  $\frac{5}{7}$ .
13. 9;  $\frac{4}{6}$ ;  $\frac{8}{6}$ .
14. (a) 1; 2;  $1\frac{1}{3}$ ;  $5\frac{2}{3}$ ; (b) 1; 2;  $1\frac{1}{6}$ ;  $1\frac{5}{6}$ ;  $2\frac{1}{6}$ .
15. (a)  $\frac{8}{12}$  ( $\frac{2}{3}$ ); (b) 1; (c) 1; (d)  $1\frac{1}{2}$ ; (e)  $1\frac{1}{12}$ .
16. (a)  $\frac{3}{4}$ ; (b)  $\frac{7}{12}$ ; (c)  $\frac{1}{3}$ ; (d)  $\frac{5}{6}$ ; (e)  $1\frac{1}{2}$ .
17. (a)  $\frac{5}{6}$ ; (b)  $\frac{1}{3}$ ; (c)  $\frac{1}{12}$ ; (d)  $\frac{1}{4}$ ; (e)  $\frac{1}{3}$ .
18. (a) £3. 3s.; (b) £2. 5s.; (c) £1. 15s.
19. (a)  $\frac{1}{6}$ ;  $\frac{2}{6}$ ;  $\frac{4}{6}$ .

#### PRACTICAL WORK

**Fractions.** Cutting, tearing, or folding paper, shading rectangles, etc. (See also page 8a.)

- (a) Revise halves, fourths, and eighths. Show, practically, that  $\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$ ;  $\frac{1}{4} = \frac{2}{8}$ .  
 (b) Revise thirds and sixths and extend to twelfths.

(c) A fraction is one or more equal parts of a whole thing. If we divide a *whole* into 5, 7, 9, etc., equal parts, each part is  $\frac{1}{5}$ ,  $\frac{1}{7}$ ,  $\frac{1}{9}$ , etc., and 5 parts are  $\frac{5}{5}$ ,  $\frac{5}{7}$ ,  $\frac{5}{9}$ , etc.

In a fraction, the number below the line is called the *denominator*, because it names the number of equal parts into which the whole is divided. The number above the line is called the *numerator*, because it names the number of equal parts to be considered.

Thus,  $\frac{5}{6}$  means that the whole has been divided into 6 equal parts, 5 of which are being considered.

(d) Show, practically, by folding paper, that  $\frac{3}{3} = 1$ ,  $\frac{6}{6} = 1$ ,  $\frac{8}{8} = 1$ . Whenever the numerator and denominator in a fraction are alike, the fraction = 1 or unity.

(e) Show, practically, by drawing rectangles and shading, that:  $\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{3}{6} = \frac{6}{12}$ .

(f) Use the ruler to show that  $\frac{9}{12} = \frac{3}{4}$ ;  $\frac{1}{2} = \frac{6}{12}$ ; etc.

(g) Simple addition and subtraction—using diagrams, top of pupil's page.

$$\frac{1}{4} + \frac{1}{8}; \frac{1}{4} - \frac{1}{8}; \frac{1}{3} + \frac{1}{6}; \frac{5}{6} - \frac{2}{3}; \text{etc.}$$

#### ORAL EXAMPLES

1. How many sixths in  $\frac{1}{3}$ ;  $\frac{1}{2}$ ;  $\frac{2}{3}$ ? How many eighths in  $\frac{1}{2}$ ;  $\frac{1}{4}$ ;  $\frac{3}{4}$ ? How many twelfths in  $\frac{1}{3}$ ;  $\frac{1}{4}$ ;  $\frac{2}{3}$ ;  $\frac{1}{6}$ ;  $\frac{3}{4}$ ;  $\frac{5}{6}$ ?
2. Reduce to lowest terms:  $\frac{2}{4}$ ;  $\frac{3}{6}$ ;  $\frac{4}{8}$ ;  $\frac{5}{10}$ ;  $\frac{6}{12}$ ;  $\frac{7}{14}$ ;  $\frac{8}{16}$ ;  $\frac{9}{18}$ ;  $\frac{10}{20}$ ;  $\frac{11}{22}$ ;  $\frac{12}{24}$ .
3. Write in another form, e.g.  $\frac{7}{6} = 1\frac{1}{6}$ : (a)  $\frac{4}{3}$ ,  $1\frac{1}{3}$ ,  $\frac{7}{6}$ ,  $\frac{8}{6}$ ,  $\frac{9}{6}$ ; (b)  $1\frac{1}{2}$ ,  $2\frac{1}{2}$ ,  $1\frac{3}{4}$ ,  $1\frac{5}{4}$ ,  $1\frac{3}{2}$ .

## Exercise 27

### Money. Addition and Multiplication

#### A. ADDITION

	(a)	(b)	(c)	(d)
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1.	$\begin{array}{r} \text{ } 3 \text{ } 9 \\ \text{ } 17 \text{ } 6 \\ \hline 1 \text{ } 7 \text{ } 8 \end{array}$	$\begin{array}{r} \text{ } 5 \text{ } 11 \\ \text{ } 14 \text{ } 9 \\ \hline 2 \text{ } 3 \text{ } 6 \end{array}$	$\begin{array}{r} \text{ } 3 \text{ } 6\frac{1}{2} \\ \text{ } 7 \text{ } 5\frac{1}{4} \\ \hline 13 \text{ } 9 \end{array}$	$\begin{array}{r} \text{ } 3 \text{ } 6\frac{1}{4} \\ \text{ } 12 \text{ } 9\frac{1}{2} \\ \hline 8 \text{ } 7\frac{1}{4} \end{array}$
2.	$\begin{array}{r} \text{ } 13 \text{ } 6 \\ \text{ } 2 \text{ } 7 \text{ } 9 \\ \text{ } 14 \text{ } 8 \\ \hline 4 \text{ } 5 \text{ } 9 \end{array}$	$\begin{array}{r} \text{ } 1 \text{ } 17 \text{ } 9 \\ \text{ } 7 \text{ } 11 \\ \text{ } 3 \text{ } 8 \text{ } 6 \\ \hline \text{ } 9 \text{ } 5 \end{array}$	$\begin{array}{r} \text{ } 3 \text{ } 11 \text{ } 8\frac{3}{4} \\ \text{ } 9 \text{ } 0 \text{ } 0\frac{1}{2} \\ \text{ } 17 \text{ } 11\frac{1}{4} \\ \hline \text{ } 5 \text{ } 9 \end{array}$	$\begin{array}{r} 11 \text{ } 10 \text{ } 3\frac{1}{2} \\ \text{ } 9 \text{ } 4\frac{1}{2} \\ \text{ } 17 \text{ } 6\frac{1}{2} \\ \hline 3 \text{ } 11\frac{1}{2} \end{array}$
3.	$\begin{array}{r} \text{ } 4 \text{ } 3 \text{ } 5 \\ \text{ } 9 \text{ } 2 \text{ } 7 \\ \text{ } 1 \text{ } 8 \text{ } 10 \\ \hline 12 \text{ } 13 \text{ } 0 \end{array}$	$\begin{array}{r} \text{ } 5 \text{ } 3 \text{ } 0 \\ \text{ } 17 \text{ } 6 \\ \text{ } 8 \text{ } 9 \text{ } 0 \\ \hline 4 \text{ } 10 \text{ } 7\frac{1}{2} \end{array}$	$\begin{array}{r} 12 \text{ } 3 \text{ } 6\frac{1}{4} \\ \text{ } 17 \text{ } 9\frac{1}{4} \\ \text{ } 2 \text{ } 18 \text{ } 7\frac{1}{4} \\ \hline 1 \text{ } 13 \text{ } 5\frac{1}{4} \end{array}$	$\begin{array}{r} 17 \text{ } 10 \text{ } 9\frac{1}{2} \\ \text{ } 1 \text{ } 15 \text{ } 8\frac{1}{2} \\ \text{ } 2 \text{ } 17 \text{ } 9\frac{1}{4} \\ \hline 3 \text{ } 9 \text{ } 8\frac{1}{4} \end{array}$
4.	$\begin{array}{r} 11 \text{ } 10 \text{ } 9 \\ \text{ } 3 \text{ } 7 \text{ } 8 \\ \text{ } 5 \text{ } 8 \text{ } 7 \\ \hline 7 \text{ } 5 \text{ } 10 \end{array}$	$\begin{array}{r} 13 \text{ } 17 \text{ } 6 \\ \text{ } 8 \text{ } 9\frac{1}{4} \\ \text{ } 13 \text{ } 11 \\ \hline 23 \text{ } 10 \text{ } 8 \end{array}$	$\begin{array}{r} \text{ } 3 \text{ } 12 \text{ } 6\frac{1}{4} \\ \text{ } 1 \text{ } 15 \text{ } 7\frac{3}{4} \\ \text{ } 9 \text{ } 13 \text{ } 8\frac{1}{2} \\ \hline 11 \text{ } 6 \text{ } 9\frac{1}{2} \end{array}$	$\begin{array}{r} \text{ } 8 \text{ } 13 \text{ } 7\frac{1}{4} \\ \text{ } 17 \text{ } 9\frac{3}{4} \\ 13 \text{ } 12 \text{ } 8\frac{1}{2} \\ \hline 1 \text{ } 19 \text{ } 6\frac{3}{4} \end{array}$

#### B. MULTIPLICATION

5. Multiply 11s. 6d. by (a) 7; (b) 8; (c) 9; (d) 10; (e) 11; (f) 12.
6. Multiply 12s. 4½d. by (a) 7; (b) 8; (c) 9; (d) 10; (e) 11; (f) 12.
7. Multiply £1. 6s. 5d. by (a) 3; (b) 4; (c) 6; (d) 7; (e) 11; (f) 12.
8. Multiply £3. 10s. 9d. by (a) 8; (b) 9; (c) 10; (d) 12.
9. Multiply £1. 4s. 1½d. by (a) 5; (b) 7; (c) 12.
10. Multiply £4. 5s. 1d. by (a) 7; (b) 9; (c) 11.
11. Multiply £1. 4s. 2½d. by (a) 6; (b) 7; (c) 8; (d) 9; (e) 10; (f) 12.

	(a)	(b)	(c)	(d)	(e)	(f)
12.	4d. × 20	3d. × 40	6d. × 30	2d. × 25	3d. × 27	4d. × 32
13.	5d. × 17	6d. × 23	7d. × 41	8d. × 19	9d. × 15	7d. × 21
14.	4s. × 14	3s. × 15	7s. × 18	8s. × 20	12s. × 21	10s. × 32
15.	15s. × 14	14s. × 16	17s. × 18	18s. × 20	19s. × 21	18s. × 18
16.	17s. × 21	14s. × 15	16s. × 31	17s. × 29	19s. × 23	15s. × 32

## Exercise 27

### Money. Addition and Multiplication

#### ANSWERS

#### A

	(a)	(b)	(c)	(d)
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1.	2 8 11	3 4 2	2 4 $8\frac{3}{4}$	3 4 11
2.	8 1 8	6 3 7	13 15 $5\frac{1}{2}$	13 1 2
3.	27 7 10	19 0 $11\frac{1}{2}$	17 13 4	25 13 $11\frac{1}{2}$
4.	27 12 10	38 10 $10\frac{1}{4}$	26 8 8	25 3 $8\frac{1}{4}$

#### B

	(a)	(b)	(c)	(d)	(e)	(f)
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
5.	4 0 6	4 12 0	5 3 6	5 15 0	6 6 6	6 18 0
6.	4 6 $7\frac{1}{2}$	4 19 0	5 11 $4\frac{1}{2}$	6 3 9	6 16 $1\frac{1}{2}$	7 8 6
7.	3 19 3	5 5 8	7 18 6	9 4 11	14 10 7	15 17 0
8.	28 6 0	31 16 9	35 7 6	42 9 0		
9.	6 0 $7\frac{1}{2}$	8 8 $10\frac{1}{2}$	14 9 6			
10.	29 15 7	38 5 9	46 15 11			
11.	7 5 3	8 9 $5\frac{1}{2}$	9 13 8	10 17 $10\frac{1}{2}$	12 2 1	14 10 6
12.	6 8	10 0	15 0	4 2	6 9	10 8
13.	7 1	11 6	1 3 11	12 8	11 3	12 3
14.	2 16 0	2 5 0	6 6 0	8 0 0	12 12 0	16 0 0
15.	10 10 0	11 4 0	15 6 0	18 0 0	19 19 0	16 4 0
16.	17 17 0	10 10 0	24 16 0	24 13 0	21 17 0	24 0 0

#### MONEY

1. Extend money to £100. See page 11a.
2. Multiplication of (a) pence; (b) shillings, using a two-figure multiplier. This work is leading up to long multiplication of money.

#### *Worked Examples*

#### *Blackboard Work*

1.  $9d. \times 36$  (choose the multiplier) =  $324d. = 27s. = \text{£}1. 7s.$
2.  $15s \times 33$  (choose the multiplier).

$$\begin{array}{r}
 s. \\
 33 \\
 15 \\
 \hline
 330 \\
 165 \\
 \hline
 20 \overline{) 495} \\
 \underline{\text{£}24. 15s.}
 \end{array}$$

#### ORAL EXERCISES

(Use the Blackboard)

- $3d. \times 13$  (3s. 3d.);  $4d. \times 27$  (9s.);  $5d. \times 37$  (15s. 5d.);  $6d. \times 31$  (15s. 6d.);  $9d. \times 18$  (13s. 6d.);  $12s. \times 21$  (£12. 12s.);  $13s. \times 15$  (£9. 15s.);  $16s. \times 17$  (£13. 12s.).

(27a)

## Exercise 28

### Money. Subtraction and Division

#### A. SUBTRACTION

	(a)	(b)	(c)	(d)	(e)	(f)
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1.	$\begin{array}{r} 17\ 5\frac{1}{2} \\ 8\ 9\frac{3}{4} \\ \hline \end{array}$	$\begin{array}{r} 15\ 6 \\ 7\ 9\frac{1}{2} \\ \hline \end{array}$	$\begin{array}{r} 1\ 15\ 6\frac{1}{2} \\ 13\ 9\frac{3}{4} \\ \hline \end{array}$	$\begin{array}{r} 1\ 12\ 11\frac{1}{2} \\ 14\ 9\frac{3}{4} \\ \hline \end{array}$	$\begin{array}{r} 1\ 14\ 5\frac{1}{4} \\ 17\ 6\frac{1}{2} \\ \hline \end{array}$	$\begin{array}{r} 5\ 11\ 4\frac{1}{2} \\ 2\ 19\ 3 \\ \hline \end{array}$
2.	$\begin{array}{r} 37\ 12\ 5 \\ 9\ 17\ 8 \\ \hline \end{array}$	$\begin{array}{r} 43\ 17\ 4 \\ 8\ 15\ 9 \\ \hline \end{array}$	$\begin{array}{r} 57\ 13\ 4 \\ 9\ 15\ 6 \\ \hline \end{array}$	$\begin{array}{r} 76\ 14\ 9 \\ 29\ 13\ 10 \\ \hline \end{array}$	$\begin{array}{r} 81\ 14\ 9 \\ 37\ 15\ 9 \\ \hline \end{array}$	$\begin{array}{r} 90\ 0\ 0 \\ 27\ 13\ 6 \\ \hline \end{array}$
3.	$\begin{array}{r} 7\ 12\ 3\frac{1}{2} \\ 6\ 16\ 9\frac{3}{4} \\ \hline \end{array}$	$\begin{array}{r} 7\ 14\ 3 \\ 3\ 16\ 8\frac{1}{2} \\ \hline \end{array}$	$\begin{array}{r} 4\ 12\ 8\frac{1}{2} \\ 2\ 17\ 11\frac{1}{2} \\ \hline \end{array}$	$\begin{array}{r} 10\ 0\ 0 \\ 2\ 12\ 7\frac{1}{2} \\ \hline \end{array}$	$\begin{array}{r} 12\ 0\ 0 \\ 3\ 18\ 4\frac{1}{4} \\ \hline \end{array}$	$\begin{array}{r} 10\ 0\ 0 \\ 4\ 13\ 7\frac{3}{4} \\ \hline \end{array}$

4. From ninety-one pounds twelve shillings take thirty-seven pounds thirteen shillings and sixpence.
5. How much must be added to £10. 3s.  $1\frac{1}{2}d.$  to make £78. 1s.  $0d.$ ?
6. Find the difference between three and a half guineas and seven pounds seven shillings and fourpence.

#### B. DIVISION

	(a)	(b)	(c)	(d)	(e)
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
7.	$9 \overline{)40\ 5\ 6}$	$8 \overline{)43\ 15\ 4}$	$9 \overline{)39\ 4\ 6}$	$7 \overline{)51\ 4\ 4}$	$5 \overline{)62\ 12\ 6}$
8.	$10 \overline{)80\ 12\ 6}$	$9 \overline{)90\ 12\ 9}$	$11 \overline{)77\ 13\ 9}$	$10 \overline{)1\ 5\ 5}$	$9 \overline{)1\ 4\ 11\frac{1}{2}}$
9.	$5 \overline{)10\ 16\ 5\frac{1}{2}}$	$6 \overline{)12\ 7\ 9}$	$7 \overline{)14\ 8\ 10\frac{3}{4}}$	$8 \overline{)8\ 10\ 10}$	$9 \overline{)18\ 19\ 8\frac{1}{4}}$
10.	$5 \overline{)6\ 6\ 3}$	$6 \overline{)13\ 7\ 6}$	$9 \overline{)19\ 11\ 6}$	$10 \overline{)21\ 4\ 2}$	$7 \overline{)22\ 12\ 1}$
11.	$8 \overline{)1\ 6\ 6}$	$12 \overline{)88\ 18\ 0}$	$11 \overline{)80\ 8\ 9}$	$9 \overline{)1\ 5\ 10\frac{1}{2}}$	$7 \overline{)1\ 2\ 5\frac{1}{2}}$

#### C. PROBLEMS

12. Five weeks' rent amounts to £4. 10s.  $10d.$  How much is that per week?
13. Father bought 12 lb. of ham for 14s.  $6d.$  How much per lb. was that?
14. The railway fares of 7 adults amounted to £18. 1s.  $1d.$  How much was that for each?
15. What will 7 weeks' rent amount to at 11s.  $7d.$  per week?
16. Find the sum of ten £5 notes, one £20 note, 17 ten-shilling notes, and 137 shillings.
17. I paid, for a bicycle, £7. 17s.  $6d.$ , and for a lamp, 12s.  $9d.$  How much had I left out of a £10 note?

## Exercise 28

### Money. Subtraction and Division

#### ANSWERS

##### A

(a)	(b)	(c)	(d)	(e)	(f)
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1. 8 7 $\frac{3}{4}$	7 8 $\frac{1}{2}$	1 1 8 $\frac{3}{4}$	18 1 $\frac{3}{4}$	16 10 $\frac{3}{4}$	2 12 1 $\frac{1}{2}$
2. 27 14 9	35 1 7	47 17 10	47 0 11	43 19 0	62 6 6
3. 15 5 $\frac{3}{4}$	3 17 6 $\frac{1}{2}$	1 14 9	7 7 4 $\frac{1}{2}$	8 1 7 $\frac{3}{4}$	5 6 4 $\frac{1}{4}$
4. £53. 18s. 6d.	5. £67. 17s. 10 $\frac{1}{2}$ d.		6. £3. 13s. 10d.		

##### B

(a)	(b)	(c)	(d)	(e)
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
7. 4 9 6	5 9 5	4 7 2	7 6 4	12 10 6
8. 8 1 3	10 1 5	7 1 3	2 6 $\frac{1}{2}$	2 9 $\frac{1}{4}$
9. 2 3 3 $\frac{1}{2}$	2 1 3 $\frac{1}{2}$	2 1 3 $\frac{1}{4}$	1 1 4 $\frac{1}{4}$	2 2 2 $\frac{1}{4}$
10. 1 5 3	2 4 7	2 3 6	2 2 5	3 4 7
11. 3 3 $\frac{3}{4}$	7 8 2	7 6 3	2 10 $\frac{1}{2}$	3 2 $\frac{1}{2}$

##### C

12. 18s. 2d.    13. 1s. 2 $\frac{1}{2}$ d.    14. £2. 11s. 7d.    15. £4. 1s. 1d.    16. £85. 7s.  
17. £1. 9s. 9d.

#### MISCELLANEOUS ORAL EXAMPLES

- Change to *s. d.*: (a) 107d. (8s. 11d.); (b) 133d. (11s. 1d.); (c) 160d. (13s. 4d.).
- Change to inches: (a) 5 ft. 3 in. (63); 7 ft. 9 in. (93); 8 ft. 6 in. (102).
- Find the cost of a dozen when 1 costs: 4d. (4s.); 5 $\frac{1}{2}$ d. (5s. 6d.); 7 $\frac{1}{4}$ d. (7s. 3d.).
- Find the cost of a score when 1 costs: 3s. (£3); 3s. 6d. (£3 $\frac{1}{2}$ ); 4s. 3d. (£4 $\frac{1}{4}$ ); 5s. 9d. (£5 $\frac{3}{4}$ ).
- 7 at 9d. each (5s. 3d.); 11 at 10d. each (9s. 2d.); 13 at 7d. each (7s. 7d.); 27 at 3d. each (6s. 9d.).
- $\frac{1}{2} + \frac{1}{4}$  ( $\frac{3}{4}$ );  $1 - \frac{3}{4}$  ( $\frac{1}{4}$ );  $\frac{1}{2} + \frac{1}{8}$  ( $\frac{5}{8}$ );  $\frac{3}{4} - \frac{1}{8}$  ( $\frac{5}{8}$ );  $1\frac{1}{2} + \frac{3}{4}$  ( $2\frac{1}{4}$ );  $\frac{3}{4} - \frac{3}{8}$  ( $\frac{3}{8}$ );  $\frac{7}{8} - \frac{1}{4}$  ( $\frac{3}{8}$ ).
- Change to (a) threehalfpence; (b) threepence: 3s. 6d. (a, 28; b, 14); 4s. 6d. (a, 36; b, 18); 8s. (a, 64; b, 32).
- Find the distance between the first and the fourth telegraph pole, the distance between any 2 being 88 yd. (264 yd.)
- Tom and John have 12 marbles between them and Tom has 4 more than John. How many has John? (4.)
- 36 at 4 for 3d. (2s. 3d.); 84 at 7d. a dozen (4s. 1d.); 42 at 3 for 4d. (4s. 6d.).
- $94 \times 30$  (2,820);  $8,190 \div 90$  (91);  $6,103 \div 70$  (87 and 13 over).
- $\frac{1}{8} + \frac{5}{12}$  ( $\frac{17}{24}$ );  $\frac{1}{4} + \frac{1}{6}$  ( $\frac{2}{3}$ );  $\frac{1}{2} - \frac{1}{6}$  ( $\frac{1}{3}$ );  $\frac{1}{3} + \frac{1}{4}$  ( $\frac{7}{12}$ );  $\frac{1}{2} - \frac{1}{3}$  ( $\frac{1}{6}$ );  $\frac{7}{12} - \frac{1}{4}$  ( $\frac{1}{3}$ ).
- 7 in. - 1 $\frac{3}{4}$  in. (5 $\frac{1}{4}$  in.); 9 $\frac{1}{2}$  in. - 3 $\frac{3}{4}$  in. (5 $\frac{1}{4}$  in.); 3 yd. - 1 yd. 1 ft. (1 yd. 2 ft.).
- 4 yd. - 1 yd. 1 ft. 6 in. (2 yd. 1 ft. 6 in.); 3 lb. 2 oz. - 1 lb. 7 oz. (1 lb. 11 oz.).

## Exercise 29

### Weights and Measures. Addition and Subtraction

1. Change to ounces: 3 lb.,  $4\frac{1}{2}$  lb.,  $4\frac{3}{4}$  lb.,  $5\frac{1}{4}$  lb., 2 lb. 2 oz., 7 lb. 4 oz., 5 lb. 12 oz., 3 lb. 13 oz.
2. Change to lb. and oz.: 32 oz., 48 oz., 64 oz., 18 oz., 53 oz., 72 oz., 102 oz., 121 oz.
3. Change to quarts: 2 gallons, 4 gall.,  $5\frac{1}{2}$  gall., 10 gall., 3 gall. 2 qt., 5 gall. 3 qt., 2 gall. 1 qt.
4. Change to pints: 3 quarts 1 pint, 2 qt. 1 pt., 2 gall. 1 pt.,  $4\frac{1}{2}$  gall., 5 gall. 3 pt.
5. Change to quarts and pints: 6 pints, 9 pt., 7 pt., 15 pt., 33 pt., 11 pt.
6. Change to gallons and quarts: 17 quarts, 13 qt., 21 qt., 32 qt., 15. qt.
7. Change to hours: 2 days, 1 day 8 hr., 3 days 12 hr., 2 days 7 hr.
8. Change to days and hours: 96 hours, 72 hours, 32 hours, 41 hours, 37 hr.

### ADDITION

(a)		(b)		(c)		(d)		(e)		(f)		(g)	
lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	gall.	qt.	gall.	qt.	gall.	qt.
9. 1	3	2	3	3	5	1	11	2	1	2	3	4	3
2	13	1	11	2	12	2	9	1	2	1	1	3	3
1	6	2	7	3	9	1	6	2	3	3	2	1	3
<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>	
tons	cwt.	tons	cwt.	tons	cwt.	ft.	in.	ft.	in.	ft.	in.	ft.	in.
10. 3	7	5	11	3	17	3	3	4	6	1	11	2	9
2	11	3	17	2	11	2	9	3	7	3	10	1	8
1	12	4	2	1	9	1	7	2	9	2	11	3	7
<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>	
yd.	ft.	yd.	ft.	yd.	ft.	dy.	hr.	dy.	hr.	dy.	hr.	dy.	hr.
11. 3	1	4	2	9	1	1	7	1	17	2	17	2	21
1	2	3	2	1	2	1	11	2	9	2	18	1	22
2	2	2	2	5	2	2	16	3	6	3	23	3	23
<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>	

### SUBTRACTION

tons cwt.		tons cwt.		tons cwt.		tons cwt.		lb. oz.		lb. oz.		lb. oz.	
12. 5	19	5	3	7	17	8	14	4	13	4	9	3	11
2	13	1	15	3	19	2	17	2	9	2	13	1	15
<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>	
ft.	in.	ft.	in.	ft.	in.	ft.	in.	qt.	pt.	qt.	pt.	qt.	pt.
13. 3	7	4	5	7	9	3	4	3	0	4	1	5	0
1	9	2	11	1	10	2	11	1	1	2	1	2	1
<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>	
dy.	hr.	dy.	hr.	dy.	hr.	dy.	hr.	yd.	ft.	yd.	ft.	yd.	ft.
14. 7	19	3	20	4	5	7	11	5	2	3	1	7	1
2	11	1	22	1	19	1	13	1	1	1	2	3	2
<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>		<hr/>	

15. A 25-foot wireless pole has 3 ft. 9 in. in the ground. What length is above ground?
16. One man weighs  $13\frac{1}{2}$  stone and another 11 stones 9 lb. Find the difference between their weights. (14 lb. = 1 stone.)
17. Use 2 lb. 7 oz. of sugar out of 4 lb. What weight is left?

## Exercise 29

### Weights and Measures. Addition and Subtraction

#### ANSWERS

1. 48; 72; 76; 84; 34; 116; 92;  
61 oz.
3. 8; 16; 22; 40; 14; 23; 9 quarts.
5. 3 qt.; 4 qt. 1 pt.; 3 qt. 1 pt.;  
7 qt. 1 pt.; 16 qt. 1 pt.; 5 qt. 1 pt.
7. 48; 32; 84; 55 hours.
8. 4 days; 3 days; 1 day 8 hr.; 1 day 17 hr.; 1 day 13 hr.
9. (a) 5 lb. 6 oz.; (b) 6 lb. 5 oz.; (c) 9 lb. 10 oz.; (d) 5 lb. 10 oz.; (e) 6 gall. 2 qt.;  
(f) 7 gall. 2 qt.; (g) 10 gall. 1 qt.
10. (a) 7 tons 10 cwt.; (b) 13 tons 10 cwt.; (c) 7 tons 17 cwt.; (d) 7 ft. 7 in.;  
(e) 10 ft. 10 in.; (f) 8 ft. 8 in.; (g) 8 ft. 0 in.
11. (a) 7 yd. 2 ft.; (b) 11 yd. 0 ft.; (c) 16 yd. 2 ft.; (d) 5 days 10 hr.; (e) 7 days 8 hr.;  
(f) 9 days 10 hr.; (g) 8 days 18 hr.
12. (a) 3 tons 6 cwt.; (b) 3 tons 8 cwt.; (c) 3 tons 18 cwt.; (d) 5 tons 17 cwt.;  
(e) 2 lb. 4 oz.; (f) 1 lb. 12 oz.; (g) 1 lb. 12 oz.
13. (a) 1 ft. 10 in.; (b) 1 ft. 6 in.; (c) 5 ft. 11 in.; (d) 5 in.; (e) 1 qt. 1 pt.; (f)  
2 qt. 0 pt.; (g) 2 qt. 1 pt.
14. (a) 5 days 8 hr.; (b) 1 day 22 hr.; (c) 2 days 10 hr.; (d) 5 days 22 hr.; (e) 4 yd.  
1 ft.; (f) 1 yd. 2 ft. (g) 3 yd. 2 ft.
15. 21 ft. 3 in.      16. 1 st. 12 lb.      17. 1 lb. 9 oz.

#### WEIGHTS AND MEASURES

1. Revise Table Items: 16 oz. = 1 lb.  
2 pints = 1 qt.; 4 qt. = 1 gall.; 8 pt. = 1 gall.  
20 cwt. = 1 ton.  
12 in. = 1 ft; 3 ft. = 1 yd.; 36 in. = 1 yard.  
60 min. = 1 hr.; 24 hr. = 1 day.
2. Easy Reduction. Upwards and Downwards.
 

<p>(a) <i>Upward</i>: The exercises on the pupil's page can be looked upon as an application of division (short or long).</p>	<p><i>Example</i>: Change 98 hr. to days and hr.</p> <div style="text-align: right; margin-right: 20px;"> <math display="block">\begin{array}{r} 4 \text{ days} \\ 24 \overline{) 98 \text{ hr.}} \\ \underline{96} \\ 2 \text{ hr.} \end{array}</math> </div> <p style="text-align: center;">(Stress the labelling of lines.)</p>
<p>(b) <i>Downward</i>: An application of multiplication (short or long).</p>	<p><i>Example</i>: Change to oz.: 5 lb. 11 oz.</p> <div style="text-align: right; margin-right: 20px;"> <math display="block">\begin{array}{r} 5 \text{ lb.} \\ 16 \\ \hline 80 + 11 = 91 \text{ oz.} \end{array}</math> </div>
3. Easy Addition and Subtraction involving a "change of unit" and a "carrying" figure.  
Give Blackboard Examples on 2 (a), 2 (b), and 3.

## Exercise 30

### Revision

1. (a)  $79 \times 26$ ; (b)  $1,723 \div 36$ ; (c)  $9,000 - 3,001$ ; (d)  $11d. \times 79$ .
  2. (a) £97. 16s.  $7\frac{1}{2}d. \div 11$ ; (b) From  $\frac{1}{4}$  of £95. 15s. 6d. take  $\frac{1}{3}$  of £35. 0s.  $1\frac{1}{2}d.$
  3. (a) 13 tons 9 cwt. - 97 cwt.; (b)  $95d. + 11$  threepences + 31 sixpences + 73s.
  4. (a) 12 gallons at 3d. a pint; (b) Length = 12 ft.; Width = 9 ft. Area = ?.
  5. (a) 221 penny stamps = ?; (b) 73 threepenny stamps = ?; (c) 22 articles at 2s. 6d. each = ?.
  6. Buy 4 pairs of stockings at 2s.  $11\frac{1}{2}d.$  a pair; change out of £1 = ?.
  7. (a)  $\frac{7}{8} - \frac{1}{2}$ ; (b)  $\frac{1}{3} + \frac{1}{4}$ ; (c)  $\frac{7}{8} + \frac{3}{4}$ ; (d)  $\frac{1}{2} - \frac{1}{3}$ .
  8. Spend £1. 13s.  $6\frac{1}{2}d. + 7s. 11d.$ ; change out of £3 = ?.
  9. Find the difference between eighteen hundred and nine and nine thousand and one.
  10. To the sum of 1,734 and 2,119 add their difference.
- 
11. A picture-show commenced at 6.30 and ended at 8.15. How many hours and minutes did it last?
  12. Butter is bought at 1s. 1d. a lb. and sold at 1s. 6d. a lb. Find the profit on 1 cwt. (112 lb.)
  13. My lawn is 6 yards 7 inches long and 5 yards 9 inches wide. Find (a) the distance all round; (b) the difference in inches between the length and the width.
  14. A cake weighs 11 lb. 7 oz. What weight of cake will be left after selling 2 lb. 3 oz. to Mrs. Smith and 4 lb. 14 oz. to Mrs. Jones?
- 
15. 410 sixpences + 720 ninepences + 115 shillings = £ s. d.
  16. A table top is 6 ft. long and 3 ft. wide. Let 1 inch stand for 1 foot and make a drawing of the table top.
  17. What is the area of *your* drawing, No. 16? How far is it all round: (a) the *actual* table top; (b) *your* drawing?
  18. Change first to feet and then to yards: (a) 144 inches; (b) 216 inches.
  19. Change to inches: (a) 3 ft. 11 in.; (b) 7 ft. 9 in.; (c) 11 ft. 7 in.



## Exercise 30

### Revision

#### ANSWERS

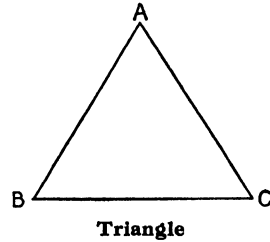
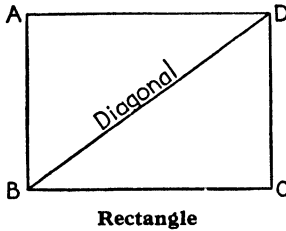
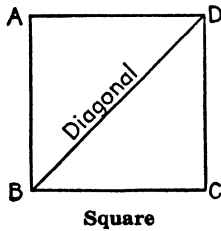
1. (a) 2,054; (b) 47 (31 R); (c) 5,999; (d) £3. 12s. 5d.; 2. (a) £8. 17s. 10½d.; (b) £12. 5s. 6d. 3. (a) 8 tons 12 cwt.; (b) £4. 19s. 2d. 4. (a) £1. 4s.; (b) 108 sq. ft. 5. (a) 18s. 5d.; (b) 18s. 3d.; (c) £2. 15s. 6. 11s. 10d.; 8s. 2d. 7. (a)  $\frac{3}{8}$ ; (b)  $\frac{1}{12}$ ; (c)  $1\frac{5}{8}$ ; (d)  $\frac{1}{8}$ . 8. Change, 18s. 6½d. 9. (a) 7,192. 10. 4,238. 11. 1 hr. 45 min. 12. £2. 6s. 8d. 13. (a) 22 yd. 2 ft. 8 in.; (b) 10 in. 14. 4 lb. 6 oz. 15. £43. 16. —. 17. 18 sq. in.; (a) 18 ft.; (b) 18 in. 18. (a) 12 ft.; 4 yd.; (b) 18 ft.; 6 yd. 19. (a) 47 in.; (b) 93 in.; (c) 139 in.

#### MISCELLANEOUS ORAL EXAMPLES

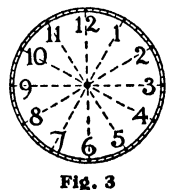
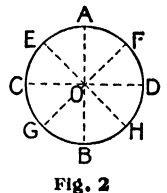
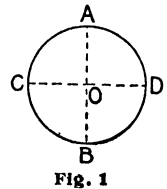
1. Change to shillings, etc.: 39 threepences (9s. 9d.); 73 threepences (18s. 3d.); 81 threepences (20s. 3d.); etc.  
(Note: "Fours" and threepences over.)
2. Change to £'s, etc.: 33 half-crowns (£4. 2s. 6d.); 71 half-crowns (£8. 17s. 6d.); 93 half-crowns (£11. 12s. 6d.); etc.  
(Note: "Eights" and half-crowns over.)
3. (a) 1½ lb. at 2s. 10d. a lb. (4s. 3d.); (b) 3½ yd. at 1s. 8d. a yd. (5s. 10d.).
4. (a) 240 at ¼d. each (5s.); (b) 135 at 5 for 6d. (13s. 6d.).
5.  $1\frac{1}{2} + 1\frac{1}{4}$  ( $2\frac{3}{4}$ );  $1\frac{3}{4} + \frac{1}{2}$  ( $2\frac{1}{4}$ );  $1\frac{1}{2} + \frac{7}{8}$  ( $2\frac{3}{8}$ );  $\frac{7}{12} - \frac{1}{3}$  ( $\frac{1}{4}$ );  $\frac{2}{3} - \frac{7}{12}$  ( $\frac{1}{12}$ ).
6. How many at 1½d. each for (a) 1s.? (8); (b) 7½d.? (5); (c) 10½d.? (7); 1s. 6d.? (12); 2s. 3d.? (18).
7. Change to £. s.: 30s. (£1. 10s.); 72s. (£3. 12s.); 85s. (£4. 5s.); 97s. (£4. 17s.).
8. How many minutes in (a) 1¼ hr.? (75); (b) 1 hr. 25 min.? (85); (c) 1¾ hr.? (105); (d) 3 hr. 13 min.? (193).
9. How many pints in 1 qt.? (2); 1 qt. 1 pt.? (3); 1¼ gall.? (10); 1 gall. 3 qt.? (14); 7 qt. 1 pt.? (15).
10. Find the cost of 1 when 20 cost (a) £2 (2s.); (b) £1. 10s. (1½s.); £3. 5s. (3¼s.); £12. 15s. (12¾s.).
11. Find the cost of 1 when a dozen cost (a) 1s. 6d. (1½d.); 2s. 3d. (2½d.); 11s. 9d. (11¾d.).
12. How many farthings in 3½d.? (14); 7¼d.? (29); 1s. 2½d.? (58); 11¾d.? (47).
13. How many pence in 3s. 6d.? (42); 7s. 9d.? (93); 11s. 3d.? (135); 12s. 11d.? (155).
14. How many days in 3 wk. 2 dy.? (23); 4 wk. 5 dy.? (33); 7 wk. 6 dy.? (55); October? (31); May? (31).
15. Change 3½ to halves (7); 3¾ to quarters (15); 1¾ to eighths (11); 3⅝ to eighths (29).
16. (a) 30 at 9d. a dozen (1s. 10½d.); 1½ at 11d. (1s. 4½d.); 3 pt. at 6d. a qt. (9d.); 5 pt. at 1s. 8d. a gall. (1s. 0½d.).
17. Change 3¼ lb. to oz. (52); 4 yd. 1 ft. to ft. (13); 1½ hr. to min. (90); 2 dy. 7 hr. to hr. (55).

## Exercise 31

### Lines and Angles: The Circle



1. Look at the square. Name the vertical lines and the horizontal lines. Which lines are parallel?
2. Repeat question 1 for the rectangle. How does a rectangle differ from a square?
3. What sorts of lines do you find in the triangle?
4. Take a circular piece of paper and fold it as shown in fig. 1 (the dotted lines represent creases). What part of the circle is each of the angles? How many degrees are there in each of the angles (fig. 1)?
5. Now fold your circle as shown in fig. 2. What part of the circle is the angle AOF? How many degrees are there in each of the angles (fig. 2)?
6. Which angles in fig. 2 are (a) right angles; (b) acute angles; (c) obtuse angles?
7. Through how many degrees does the minute hand of a clock move (a) in 5 minutes (see fig. 3); (b) in 10 mins.; (c) in 15 mins.; (d) in 20 mins.; (e) in 30 mins.; in 45 mins.; in 25 mins.; in 60 mins.; in 45 mins.?
8. Take a square piece of cardboard and draw a diagonal (see square above). Cut along the diagonal and you have two set-squares. Examine one of the set-squares and note the angles.
9. Use your set-square and ruler to draw a number of right angles.
10. Use your set-square and ruler to draw (a) a square where sides are 3 inches; (b) a rectangle, 4 inches long and 3 inches wide. How far is it round the square? How far is it round the rectangle?
11. Draw (a) a triangle having a right angle; (b) a triangle having an obtuse angle. Name the other angles in each figure.
12. On the card of a mariner's compass (see p. 4), the line joining North and South is at right angles to the line joining East and West. Draw these lines and put in N., S., E., W.



## Exercise 31

### Lines and Angles: The Circle

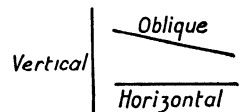
#### ANSWERS

- |  |   |
|--|---|
| <p>1. Vertical lines, AB and DC.<br/>Horizontal lines, AD and BC.<br/>Parallel lines, AB and DC; AD and BC.</p> <p>2. Sides are not all equal.</p> <p>3. Two oblique lines and one horizontal line.</p> <p>4. <math>\frac{1}{4}</math>; <math>90^\circ</math>.</p> <p>5. <math>\frac{1}{8}</math>; <math>45^\circ</math>.</p> <p>11. Other angles, acute angles.</p> | <p>6. Rt. angles, AOD, DOB, etc.<br/>Acute angles, AOF, FOD, etc.<br/>Obtuse angles, AOH, FOB, etc.</p> <p>7. (a) <math>30^\circ</math>; (b) <math>60^\circ</math>; (c) <math>90^\circ</math>; etc.</p> <p>8. —.</p> <p>9. —.</p> <p>10. 1 ft.; 1 ft. 2 in.</p> <p>12. —.</p> |
|--|---|

#### LINES AND ANGLES. AN INTRODUCTION

1. Lines: (a) Straight; (b) Curved; (c) Parallel.  
Straight lines: (a) Vertical; (b) Horizontal; (c) Oblique.  
Show vertical lines (wall, desk, etc.); horizontal (table top, floor, etc.); oblique (top of teacher's desk, scholar's desk), by drawing in chalk on the surfaces mentioned.  
Parallel lines: Top and bottom edges of pane of glass, chalk box, etc. Practise drawing vertical, horizontal, and oblique lines.
2. Angles: Examples of right angle, obtuse angle, and acute angle to be pointed out in classroom. Practise drawing the 3 kinds of angles.  
(Note: Don't trouble about definitions, but get clear ideas.)
3. Angular measure. The Circle.  
Draw a circle on the blackboard and put in the horizontal and vertical diameters. Show the four angles — each  $\frac{1}{4}$  part of the circle — each a right angle.  
Show, by means of a pair of scissors, a right angle, an acute angle, an obtuse angle. As each is formed the pupil should draw it by tracing along the edges of the scissors. Write the names inside the angles.  
There are  $360^\circ$  in a circle; a right angle contains  $90^\circ$ ; an acute angle contains less than  $90^\circ$ , and an obtuse angle more than  $90^\circ$ .
4. Use the clock face to show angles of different sizes, e.g.  $30^\circ$ ,  $45^\circ$ , etc.  
(See No. 7, pupil's page.)

#### *Blackboard Work*



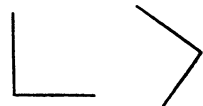
(a) *Straight lines*



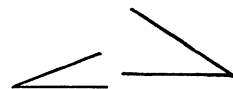
(b) *Curved lines*



(c) *Parallel lines*



(d) *Right angles*



(e) *Acute angles*



(f) *Obtuse angles*

## Exercise 32

### The Simple Rules

Add, in columns and rows:

	(a)	(b)	(c)
1.	$37 + 65 + 121 =$	$372 + 384 + 35 =$	$359 + 759 =$
2.	$43 + 98 + 93 =$	$562 + 197 + 27 =$	$1,234 + 863 =$
3.	$91 + 34 + 116 =$	$173 + 169 + 119 =$	$757 + 1,275 =$
4.	$72 + 91 + 87 =$	$148 + 183 + 157 =$	$1,237 + 1,216 =$
5. Totals	<u>          </u>	<u>          </u>	<u>          </u>

	(a)	(b)	(c)	(d)	(e)	(f)
6.	2,091	6,351	1,219	2,163	3,127	2,139
	+ 1,876	+ 796	+ 729	+ 378	+ 597	+ 756
	+ 3,159	+ 103	+ 889	+ 457	+ 1,264	+ 1,347
	+ <u>1,199</u>	+ <u>1,827</u>	+ <u>5,216</u>	+ <u>2,719</u>	+ <u>1,345</u>	+ <u>2,179</u>

7. Find the sum of thirty-three, two thousand and one, one thousand nine hundred and thirty-six, and three thousand and fifty-seven.

	(a)	(b)	(c)	(d)	(e)	(f)
8.	3,745	6,352	9,348	3,627	5,001	7,311
	- <u>1,876</u>	- <u>6,293</u>	- <u>7,908</u>	- <u>787</u>	- <u>1,347</u>	- <u>2,324</u>

Subtract, in columns and rows. Check your answers.

	(a)	(b)	(c)	(d)	(e)	(f)
9.	7,234	1,639	5,311	2,176	7,316	4,239
10.	<u>3,549</u>	<u>739</u>	<u>2,164</u>	<u>1,378</u>	<u>3,167</u>	<u>2,749</u>
11.	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>	<u>          </u>

12. Find the difference between three hundred and thirteen and four thousand and ten.

13. Multiply 89 by (a) 6; (b) 9; (c) 12; (d) 18; (e) 27; (f) 39; (g) 47.

	(a)	(b)	(c)	(d)	(e)	(f)
14.	$38 \times 23$	$75 \times 39$	$95 \times 27$	$108 \times 41$	$179 \times 43$	$225 \times 39$
15.	$357 \times 15$	$410 \times 20$	$238 \times 37$	$505 \times 19$	$190 \times 28$	$138 \times 46$
16.	$305 \times 19$	$437 \times 17$	$176 \times 40$	$360 \times 20$	$138 \times 39$	$95 \times 76$

17. Find the product of two hundred and nineteen and thirty-two.

	(a)	(b)	(c)	(d)	(e)	(f)
18.	$4,473 \div 21$	$5,763 \div 51$	$9,703 \div 31$	$8,692 \div 41$	$6,844 \div 61$	$9,720 \div 81$
19.	$3,795 \div 33$	$4,902 \div 43$	$3,774 \div 34$	$2,574 \div 22$	$3,828 \div 33$	$5,280 \div 44$
20.	$1,273 \div 51$	$3,769 \div 67$	$4,326 \div 39$	$1,273 \div 21$	$4,326 \div 52$	$7,284 \div 93$
21.	$4,537 \div 21$	$5,736 \div 34$	$3,079 \div 35$	$2,698 \div 17$	$4,486 \div 57$	$2,017 \div 26$

22. Find the quotient when two thousand three hundred and eleven is divided by fifty-four.

## Exercise 32

### The Simple Rules

#### ANSWERS

	(a)	(b)	(c)				
1.	223	791	1,118				
2.	234	786	2,097				
3.	241	461	2,032				
4.	250	488	2,453				
5.	243; 288; 417; 948	1,255; 933; 338; 2,526	3,587; 4,113; 7,700				
6.	(a) 8,325; (b) 9,077; (c) 8,053; (d) 5,717; (e) 6,333; (f) 6,421.	7. 7,027.					
8.	(a) 1,869; (b) 59; (c) 1,440; (d) 2,840; (e) 3,654; (f) 4,987.						
9.	(a) 5,595	(b) 3,135	(c) 3,077				
10.	(a) 2,810	(b) 786	(c) 418				
11.	(a) 3,685; 900	(b) 3,147; 798	(c) 4,149; 1,490				
12.	3,697.						
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
13.	534	801	1,068	1,602	2,403	3,471	4,183
14.	874	2,925	2,565	4,428	7,697	8,775	
15.	5,355	8,200	8,806	9,595	5,320	6,348	
16.	5,795	7,429	7,040	7,200	5,382	7,220	
17.	7,008						
18.	213	113	313	212	112 (12 R)	120	
19.	115	114	111	117	116	120	
20.	24 (49 R)	56 (17 R)	110 (36 R)	60 (13 R)	83 (10 R)	78 (30 R)	
21.	216 (1 R)	168 (24 R)	87 (34 R)	158 (12 R)	78 (40 R)	77 (15 R)	
22.	42 (43 R)						

#### MISCELLANEOUS ORAL EXERCISES

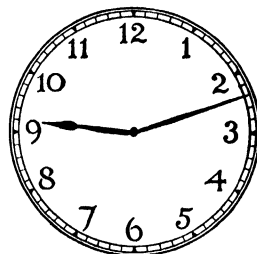
- Cart and coal together weigh 1 ton 15 cwt.; cart weighs 7 cwt. Find the weight of the coal. (1 ton 8 cwt.)
- A girl saved 3d. a week for 19 weeks. How much was she short of 10s.? (5s. 3d.)
- 4 rugs worth 12s. 6d. each were exchanged for 5 chairs, all of equal value. What was a chair worth? (10s.)
- A pint of water weighs 1 lb. 4 oz. Find the weight of  $1\frac{1}{2}$  qt. (3 lb. 12 oz.)
- What is left out of £7 after paying 6 guineas for a coat and 8s. 6d. for a hat? (5s. 6d.)
- A green-grocer has 1 ton of potatoes. He sells  $\frac{1}{2}$  of them to one customer and  $\frac{1}{4}$  to another customer. What weight has he left? (5 cwt.)
- I give away  $\frac{1}{12}$  of 96 sweets. How many have I left? (88.)
- Change to weeks and days: 110 days. (15 wk. 5 dy.)
- 120 post-cards at 2d. each. (£1.)
- How many £'s in 210 florins? (£21.)
- (a)  $\frac{1}{2}$  of 7 gall. (3 gall. 2 qt.); (b) Change  $2\frac{3}{4}$  yd. to yd. ft. and in. (2 yd. 2 ft. 3 in.)

## Exercise 33

### The Clock. Time

1. How many (a) hours; (b) minutes from 12 o'clock to 2 o'clock; from 1 o'clock to 5 o'clock; from 3 o'clock to 10 o'clock; from 9 o'clock to 8 o'clock; from 6 o'clock to 3 o'clock?
2. How many minutes are there (a) from 2 o'clock to 10 min. past 4; (b) from 5 min. past 2 to 5 min. to 3; (c) from 3 min. past 12 to 5 min. to 1; (d) from 15 min. past 3 to 4 min. past 4?
3. How many hours are there (a) from 9 o'clock in the morning to 6 o'clock in the evening; (b) from 7 o'clock in the evening to 4 o'clock next morning; (c) from 8 o'clock Friday morning to 7 o'clock Sunday evening; (d) from 9 a.m. to 6 p.m. on the same day; (e) from 4 p.m. to 3 a.m. next day?
4. It is now 12 noon. What time was it (a)  $1\frac{3}{4}$  hours ago; (b) 35 min. ago; (c) 95 min. ago?
5. School starts at 9 in the morning and goes on till noon. In the afternoon it starts at half-past one and goes on till 4 o'clock. Write these times in the shortened form, showing *before* noon and *after* noon where necessary.
6. How many minutes are there (a) from 9 a.m. to 10.35 a.m. the same day; (b) from 9.5 p.m. to 6.30 a.m. next morning; (c) from 1.53 p.m. to 11.13 p.m. the same day?

Class Time Table. Morning Session							
	9	9.35	10.20	10.40	10.55	11.40	12
Monday	Scripture	Arithmetic	P.T.	Play-time	History	English	



7. Look at the Class Time-table. Now copy out and fill in the table below, for each lesson. Scripture has been done for you.

Lesson	Commences	Ends	Time it goes on
Scripture Arithmetic P.T. Play etc., etc.	9 a.m.	9.35 a.m.	35 minutes

8. A train leaves London at 11.55 p.m. and arrives Liverpool at 5.45 a.m. How long does it take?
9. The match commenced at 2.45 p.m. and finished at 4.25 p.m. How long did it take?
10. (a) What time does the clock face show? (b) what time did it show 17 minutes before? what time will it show after 1 hour 7 min. have passed?

## Exercise 33

### The Clock. Time

#### ANSWERS

1. (a) 2 hr.; (b) 120 min.; (a) 4 hr.; (b) 240 min.; (a) 7 hr.; (b) 420 min.; (a) 11 hr.; (b) 660 min.; (a) 9 hr.; (b) 540 min.
2. (a) 130 min.; (b) 50 min.; (c) 52 min.; (d) 49 min.
3. (a) 9 hr.; (b) 9 hr.; (c) 59 hr.; (d) 9 hr.; (e) 11 hr.
4. (a) 10.15 a.m.; (b) 11.25 a.m.; (c) 10.25 a.m.
5. 9 a.m. to noon; 1.30 p.m. to 4 p.m.
6. (a) 95 min.; (b) 565 min.; (c) 560 min.
7. *Scripture*: 9 a.m. to 9.35 a.m.; 35 min. *Arithmetic*: 9.35 a.m. to 10.20 a.m.; 45 min. *P. T.*: 10.20 a.m. to 10.40 a.m.; 20 min. *Play*: 10.40 a.m. to 10.55 a.m.; 15 min. *History*: 10.55 a.m. to 11.40 a.m.; 45 min. *English*: 11.40 a.m. to 12 noon; 20 min.
8. 5 hr. 50 min.      9. 1 hr. 40 min.      10. (a) 9.12; (b) 8.55; (c) 10.19.

#### A. PRACTICAL WORK. TIME

- (a) Use the demonstration clock to revise and extend "telling the time".  
(b) Use the clock to show (a) the number of hours; (b) the number of min. from, say, 9 o'clock to 11 o'clock; 10 o'clock to half-past 1; 12 o'clock to 12 o'clock; etc.  
Learn: 60 min = 1 hr.; 24 hr. = 1 day.

#### B. WRITING THE TIME

(Shortened Forms)

- (a) Revise: 8.30 means half-past or 30 minutes past 8.  
3.13 means thirteen min. past 3; etc.
- (b) A.M. and P.M.    A.M. (a.m.) is short for ante-meridian, and means *before* noon.  
P.M. (p.m.) is short for post-meridian, and means *after* noon.  
12 o'clock stands for either 12 noon or 12 midnight.

#### C. RECKONING TIME

*Example 1.* How many hours from 9 p.m. to 3 a.m. next morning?

9 p.m. to midnight (3 hr.); midnight to 3 a.m. (3 hr.).

No. of hours = 6.

*Example 2.* How many hours and min. from 7.40 a.m. to 1.7 p.m.?

Work as follows:

7.40 a.m. to 8 a.m. (make up the next hour) = 20 min.	} Total,
8 a.m. to noon (make up noon or midnight) = 4 hr.	
Noon to 1.7 p.m. = 1 hr. 7 min.	

5 hr. 27 min.

## Exercise 34

### Money. Addition, Subtraction, and Division

#### A. ADDITION

1. 7s. 6d. + 16s. 7d. + £1. 13s. 5d.
2. 16s. 9d. + £2. 7s. 9d. + 18s. 4d. + £17. 5s. 9d.
3. £1. 13s. 7½d. + £1. 7s. 9¼d. + 18s. 9d.
4. £22. 13s. 7¼d. + 17s. 9½d. + 7s. 6¼d. + £11. 13s. 4½d.
5. 13s. 6d. + £2. 9s. 7d. + 18s. 4d. + £9. 5s. 4d.
6. £14. 13s. 5d. + £19. 17s. 2d. + £11. 10s. 8d. + £12. 16s. 5d.
7. £3. 18s. 11¾d. + £19. 10s. 10½d. + 17s. 11½d. + £30. 0s. 0½d.
8. £18. 13s. 9¼d. + £13. 19s. 7¾d. + £15. 13s. 9½d. + £23. 19s. 7¾d.
9. Find the value of  
357d. + 416 half-pence + 135 threepences + 215 half-crowns.

#### B. SUBTRACTION

1. (a) 18s. 5½d. - 7s. 8¾d. (b) 19s. 3d. - 9s. 7½d.  
(c) £1. 16s. 5½d. - 19s. 7¾d.
2. £77. 12s. 3d. - £19. 18s. 7d. (b) £93. 14s. 7d. - £28. 17s. 8d.  
(c) £77. 14s. 3d. - £59. 16s. 5d.
3. £90. 0s. 0d. - £74. 17s. 4¾d. (b) £78. 15s. 3d. - £39. 14s. 9¾d.  
(c) £80. 0s. 0½d. - £37. 1s. 11¼d.
4. (a) £94. 12s. 7½d. - £77. 17s. 8¾d. (b) £93. 0s. 0d. - £57. 0s. 3¼d.  
(c) £73. 15s. 6¼d. - £49. 19s. 8½d.
5. Find the value of (£3. 1s. 2½d. + 326 threehalfpence) - (273d. + 176 farthings).

#### C. DIVISION

- | (a)                  | (b)                | (c)                |
|----------------------|--------------------|--------------------|
| 1. £49. 4s. 9d. ÷ 9  | £52. 3s. 4d. ÷ 8   | £78. 5s. 3d. ÷ 9   |
| 2. £58. 11s. 4d. ÷ 7 | £67. 17s. 6d. ÷ 5  | £59. 18s. 8d. ÷ 8  |
| 3. £81. 2s. 6d. ÷ 10 | £77. 2s. 9d. ÷ 11  | £1. 13s. 11¼d. ÷ 9 |
| 4. £88. 6s. 0d. ÷ 12 | £10. 5s. 10½d. ÷ 9 | £15. 2s. 5½d. ÷ 7  |
5. A dozen rugs cost £16. 2s. What must we pay for 5?

#### D. MISCELLANEOUS

1. What will 1¾ lb. of tea cost at 2½d. an oz.?
2. Tea is bought at 2s. 3d. a lb. and sold at 2s. 8d. a lb. Find the profit on 1 cwt. (112 lb.).
3. Change (a) £1. 7s. 6d. to pence; (b) 12s. 4½d. to threehalfpences; (c) £2. 10s. to half-crowns.
4. Eggs are bought at 1s. 8d. a score and sold at 1s. 6d. a dozen. Find the profit on 6 dozen.
5. 220 threehalfpences + 115s. + 178 halfpence + 213d.
6. What is the difference between 346d. and 27 half-crowns?
7. (a) How many articles at 1s. each can be bought for £23. 17s.; at 6d. each, for 19s. 6d.?
8. Find the difference between one-eighth of seventy-five pounds fifteen shillings and sixpence and one-quarter of fifteen pounds seventeen shillings and tenpence.
9. (a) 1 yard 1 ft. 1 inch at ½d. an inch. (b) 1 gall. 1 qt. 1 pt. at 3d. a pint.



## Exercise 34

### Money. Addition, Subtraction, and Division

#### ANSWERS

##### A

£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1. 2	17	6	3. 4	0	1½	5. 13	6	9	7. 54	7	10
2. 21	8	7	4. 35	12	3½	6. 58	17	8	8. 72	6	10½
									9. 30	18	4

##### B

(a)			(b)			(c)			(a)			(b)			(c)				
£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.		
1.	10	8 $\frac{3}{4}$							3.	15	2	7 $\frac{1}{2}$	39	0	5 $\frac{1}{4}$	42	18	11 $\frac{1}{4}$	
2.	57	13	8	64	16	11	17	17	10	4.	16	14	10 $\frac{3}{4}$	35	19	8 $\frac{3}{4}$	23	15	9 $\frac{3}{4}$
5.	3	15	6 $\frac{1}{2}$																

##### C

(a)			(b)			(c)			(a)			(b)			(c)		
	£	s.	d.	£	s.	d.	£	s.	d.		£	s.	d.	£	s.	d.	
1.	5	9	5	6	10	5	8	13	11	3.	8	2	3	7	0	3	
2.	8	7	4	13	11	6	7	9	10	4.	7	7	2	1	2	10½	
5.	6	14	2											2	3	2½	

##### D

1. 5s. 10d.    2. £2. 6s. 8d.    3. (a) 330d.; (b) 99 threehalfpence; (c) 20 half-crowns.  
 4. 3s.    5. £8. 7s. 8d.    6. £1. 18s. 8d.    7. (a) 477; (b) 39.    8. £5. 9s. 11½d.  
 9. (a) 2s. 0½d.; (b) 2s. 9d.

#### 1. EASY REDUCTION—ORAL EXAMPLES

- Change to threehalfpence: (a) 7s. (56); 5s. 1½d. (41); 7s. 10½d. (63); etc. (eights.)
- Change to half-crowns: (a) 7s. 6d. (3); £1. 2s. 6d. (9); £2. 12s. 6d. (21); etc.
- Change to inches: (a) 1 ft. 6 in. (18); 1 yd. 3 in. (39); 1 yd. 1 ft. 2 in. (50); etc.
- Change to pt.: (a) 1 gall. 1 pt. (9); 1 gall. 1 qt. (10); 1 gall. 2 qt. 1 pt. (13); etc.

#### 2. DOWNWARD REDUCTION TABLES. MONEY

(a)		
farthings (¼d.)	pence (d.)	shillings (s.)
4	12	
48		
960	240	20

The usual form of the money table is to be found in (a) as:

4 farthings = 1d.	} See Ringed Numbers.
12d. = 1s.	
20s. = £1	

The other spaces have been filled in, as:

(a) 12d. = 1s.; 240d. = £1.	} Mental Arith- metic Exercises.
(b) 4 fars. = 1d.; 48 fars. = 1s.	
(c) 48 fars. = 1s.; 960 fars. = £1.	

Examples on the table. (Note: Intermediate steps are omitted.)

- Change to farthings: £1 (960); £1. 1s. (960 + 48); £1. 2s. 6d. (960 + 96 + 24).
- Change to pence: £1 (240); £1. 2s. (240 + 24); £1. 2s. 6d. (240 + 30).

## Exercise 35

### Reduction. Money

	(a)	(b)	(c)	(d)
1. Change to pence:	14s. 9d.	15s. 11d.	£1. 12s. 6d.	£2. 13s. 11d.
2. Change to halfpence:	7s. 8d.	5s. 7½d.	£1. 9s. 4½d.	£2. 3s. 6½d.
3. Change to farthings:	5s. 2¼d.	7s. 4¾d.	£1. 3s. 3¼d.	£2. 5s. 7¾d.
4. Change to threepences:	6s. 3d.	17s. 9d.	£1. 3s. 3d.	£2. 7s. 9d.
5. Change to sixpences:	12s. 6d.	19s. 0d.	£1. 3s. 6d.	£2. 7s. 0d.
6. Change to threehalfpences:	5s. 3d.	7s. 6d.	£1. 2s. 3d.	£2. 5s. 10½d.

123; 279; 376; 436; 673; 963; 1,000.

7. Call the numbers (above) pence and change to *s. d.*, or *£. s. d.*
8. Call the numbers halfpence and change to *s. d.*, or *£. s. d.*
9. Call the numbers farthings and change to *s. d.*, or *£. s. d.*
10. Call the numbers threehalfpences and change to *s. d.*, or *£. s. d.*
11. Call the numbers threepences and change to *s. d.*, or *£. s. d.*
12. Call the numbers sixpences and change to *s. d.*, or *£. s. d.*
13. Call the numbers half-crowns and change to *£. s. d.* (Leave out 963, and 1,000.)

### MISCELLANEOUS EXERCISES

14. Find the difference between 379 pence and 379 threehalfpences.
15. Find the cost of (a) 796 at ½d. each; (b) 479 at threepence each; (c) 1,231 at ¼d. each.
16. 379d. + 189 halfpence + 59 threepences + 100 sixpences.
17. How many articles at 2s. 6d. each can I buy for £2. 17s. 6d.?
18. What will 1,200 articles cost at ¼d. each?
19. 300 halfpenny stamps + 400 penny stamps + 315 threehalfpenny stamps.  
Find the total cost.
20. Find the change out of £5 after buying 373 twopenny stamps.
21. 345 sixpences — 345 threepences.
22. 1,000 threehalfpences — 1,000 pence.

## Exercise 35

### Reduction. Money

#### ANSWERS

- | (a)   | (b) | (c)   | (d)   | (a)    | (b) | (c) | (d)   |
|---|-----|-------|-------|--------|-----|-----|-------|
| 1. 177  | 191 | 390   | 647   | 2. 184 | 135 | 705 | 1,045 |
| 3. 249  | 355 | 1,117 | 2,191 | 4. 25  | 71  | 93  | 191   |
| 5. 25   | 38  | 47    | 94    | 6. 42  | 60  | 178 | 367   |
| 7. 10s. 3d.    £1. 3s. 3d.;    £1. 11s. 4d.;    £1. 16s. 4d.;    £2. 16s. 1d.;    £4. 0s. 3d.;<br>£4. 3s. 4d.                             |     |       |       |        |     |     |       |
| 8. 5s. 1½d.;    11s. 7½d.;    15s. 8d.;    18s. 2d.;    £1. 8s. 0½d.;    £2. 0s. 1½d.;    £2. 1s. 8d.                                     |     |       |       |        |     |     |       |
| 9. 2s. 6¾d.;    5s. 9¾d.;    7s. 10d.;    9s. 1d.;    14s. 0½d.;    £1. 0s. 0¾d.;    £1. 0s. 10d.   |     |       |       |        |     |     |       |
| 10. 15s. 4½d.;    £1. 14s. 10½d.;    £2. 7s.;    £2. 14s. 6d.;    £4. 4s. 1½d.;    £6. 0s. 4½d.;    £6. 5s.                               |     |       |       |        |     |     |       |
| 11. £1. 10s. 9d.;    £3. 9s. 9d.;    £4. 14s.;    £5. 9s.;    £8. 8s. 3d.;    £12. 0s. 9d.;    £12. 10s.                                  |     |       |       |        |     |     |       |
| 12. £3. 1s. 6d.;    £6. 19s. 6d.;    £9. 8s.;    £10. 18s.;    £16. 16s. 6d.;    £24. 1s. 6d.;    £25.                                    |     |       |       |        |     |     |       |
| 13. £15. 7s. 6d.;    £34. 17s. 6d.;    £47;    £54. 10s.;    £84. 2s. 6d.   |     |       |       |        |     |     |       |
| 14. 15s. 9½d.                      15. (a) £1. 13s. 2d.; (b) £5. 19s. 9d.; (c) £1. 5s. 7¾d.   |     |       |       |        |     |     |       |
| 16. £5. 4s. 2½d.                      17. 23.                                      18. £1. 5s.  |     |       |       |        |     |     |       |
| 19. £4. 5s. 2½d.                      20. £1. 17s. 10d.                              21. £4. 6s. 3d.                      22. £2. 1s. 8d. |     |       |       |        |     |     |       |

#### REDUCTION OF MONEY

##### 1. Downward Reduction Tables. (Continued from page 34a.)

(a)

farthings		halfpence		pence		shillings		florins		ten-shil'gs	
2		1		2		2		1		2	
4		2		4		4		2		4	
48		24		12		6		3		6	
96		48		24		12		6		12	
480		240		120		60		30		60	
960		480		240		120		60		120	

(b)

halfpence		three h'd.		sixpences		shillings		h'crowns		ten-shil'gs	
3		1		2		2		1		2	
12		4		8		4		2		4	
24		8		16		8		4		8	
60		20		40		20		10		20	
240		80		160		80		40		80	
480		160		320		160		80		160	

(1) Build up the tables, page 34a.

(2) Exercises on the tables:

(a) How many ¼d. bars of chocolate for £1? (960.)

(b) 1,000 at ¼d. each. (960 + 40 = £1. 0s. 10d.)

(c) Half-crowns in £1. 10s. (8 + 4 = 12.)

(d) Threeshillings in £2. (160 × 2 = 320.)

*Note:* Constant practice on the tables will result in the addition of many more table items to the "vocabulary of arithmetic".

##### 2. Downward Reduction.

*Ex.* 1. Change to (a) farthings, £2. 12s.

$$\begin{array}{rcl}
 \text{(a)} & £2 & = 960 \times 2 = 1,920 \\
 & 12s. & = 48 \times 12 = + 576 \\
 \hline
 & £2. 12s. & = 2,496
 \end{array}$$

##### 3. Upward Reduction.

*Ex.* 1. Change 1,213 farthings to £. s. d.

$$\begin{array}{r}
 4 \overline{) 1,213} \text{ farthings} \\
 \underline{12} \phantom{00} 303 \frac{1}{4} d. \\
 20 \overline{) 25} 3 \frac{1}{4} d. = £1. 5s. 3 \frac{1}{4} d.
 \end{array}$$

## Exercise 36

### Money. Long Multiplication

- |                         | (a) | (b) | (c) | (d) | (e) | (f) |
|-------------------------|-----|-----|-----|-----|-----|-----|
| 1. Multiply £2. 13s. by | 7   | 8   | 9   | 10  | 11  | 12  |
| 2. Multiply 1s. 10d. by | 7   | 8   | 9   | 10  | 11  | 12  |
| 3. Multiply 1s. 1d. by  | 13  | 14  | 15  | 16  | 17  | 18  |
| 4. Multiply 1s. 3d. by  | 16  | 18  | 21  | 33  | 27  | 31  |
| 5. Multiply 2s. 8d. by  | 20  | 23  | 26  | 29  | 31  | 35  |
| 6. Multiply 3s. 4d. by  | 18  | 21  | 27  | 30  | 33  | 36  |
| 7. Multiply 4s. 7d. by  | 17  | 19  | 22  | 26  | 29  | 31  |
| 8. Multiply 3s. 11d. by | 19  | 21  | 25  | 29  | 33  | 36  |
9. (a)  $\frac{1}{4}d. \times 19$ ; (b)  $\frac{1}{2}d. \times 33$ ; (c)  $\frac{3}{4}d. \times 35$ ; (d)  $1d. \times 43$ ; (e)  $1\frac{1}{2}d. \times 21$ .
10. (a)  $1\frac{1}{4}d. \times 19$ ; (b)  $1\frac{1}{2}d. \times 33$ ; (c)  $1\frac{3}{4}d. \times 35$ ; (d)  $2\frac{1}{4}d. \times 43$ ; (e)  $2\frac{1}{2}d. \times 34$ .
11. (a)  $2\frac{1}{4}d. \times 21$ ; (b)  $2\frac{1}{2}d. \times 35$ ; (c)  $2\frac{3}{4}d. \times 41$ ; (d)  $3\frac{1}{4}d. \times 37$ ; (e)  $3\frac{1}{2}d. \times 73$ .
12. (a)  $4\frac{1}{2}d. \times 31$ ; (b)  $3\frac{1}{4}d. \times 43$ ; (c)  $4\frac{3}{4}d. \times 27$ ; (d)  $5\frac{1}{2}d. \times 53$ ; (e)  $5\frac{1}{4}d. \times 55$ .
13. (a)  $7\frac{1}{2}d. \times 31$ ; (b)  $5\frac{3}{4}d. \times 43$ ; (c)  $9\frac{1}{2}d. \times 34$ ; (d)  $7\frac{3}{4}d. \times 41$ ; (e)  $6\frac{1}{2}d. \times 49$ .
14. (a)  $1s. 1\frac{1}{2}d. \times 21$ ; (b)  $1s. 6\frac{1}{2}d. \times 32$ ; (c)  $2s. 2\frac{1}{4}d. \times 17$ ; (d)  $2s. 3\frac{3}{4}d. \times 14$ ;  
(e)  $3s. 1\frac{1}{4}d. \times 31$ .
15. (a)  $1s. 2\frac{1}{4}d. \times 19$ ; (b)  $2s. 1\frac{3}{4}d. \times 18$ ; (c)  $3s. 2\frac{1}{2}d. \times 21$ ; (d)  $3s. 3\frac{3}{4}d. \times 19$ ;  
(e)  $2s. 6\frac{1}{4}d. \times 23$ .
16. (a)  $1s. 3\frac{1}{2}d. \times 18$ ; (b)  $3s. 2\frac{1}{4}d. \times 19$ ; (c)  $4s. 1\frac{1}{4}d. \times 25$ ; (d)  $1s. 7\frac{1}{4}d. \times 21$ ;  
(e)  $3s. 3\frac{1}{2}d. \times 19$ .
17. Find the cost of 27 articles at 1s. 3d. each.
18. A National Savings Certificate costs 16s. What must be paid for 15?
19. Father is paid at the rate of 2s.  $1\frac{1}{2}d.$  an hour. How much does he earn in a week of 47 hours?
20. Find the cost of 31 toys at  $6\frac{1}{2}d.$  each.
21. Milk is  $3\frac{1}{2}d.$  a pint. What must be paid for 25 pints?
22. Writing pads are  $10\frac{1}{2}d.$  each. Find the cost of 21.
23. What must be paid for 26 stamps at 1s. 5d. each?
24. Tobacco is  $9\frac{1}{2}d.$  an oz. How much is that per lb.?

## Exercise 36

### Money. Long Multiplication

#### ANSWERS

(a)	(b)	(c)	(d)	(e)	(f)
£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1. 18 11 0	21 4 0	23 17 0	26 10 0	29 3 0	31 16 0
2. 12 10	14 8	16 6	18 4	1 0 2	1 2 0
3. 14 1	15 2	16 3	17 4	18 5	19 6
4. 1 0 0	1 2 6	1 6 3	2 1 3	1 13 9	1 18 9
5. 2 13 4	3 1 4	3 9 4	3 17 4	4 2 8	4 13 4
6. 3 0 0	3 10 0	4 10 0	5 0 0	5 10 0	6 0 0
7. 3 17 11	4 7 1	5 0 10	5 19 2	6 12 11	7 2 1
8. 3 14 5	4 2 3	4 17 11	5 13 7	6 9 3	7 1 0
9. 4 $\frac{3}{4}$	1 4 $\frac{1}{2}$	2 2 $\frac{1}{4}$	3 7	2 7 $\frac{1}{2}$	
10. 1 11 $\frac{3}{4}$	4 1 $\frac{1}{2}$	5 1 $\frac{1}{4}$	8 0 $\frac{3}{4}$	7 1	
11. 3 11 $\frac{1}{4}$	7 3 $\frac{1}{2}$	9 4 $\frac{3}{4}$	10 0 $\frac{1}{4}$	1 1 3 $\frac{1}{2}$	
12. 11 7 $\frac{1}{2}$	11 7 $\frac{3}{4}$	10 8 $\frac{1}{4}$	1 4 3 $\frac{1}{2}$	1 4 0 $\frac{3}{4}$	
13. 19 4 $\frac{1}{2}$	1 0 7 $\frac{1}{4}$	1 6 11	1 6 5 $\frac{3}{4}$	1 6 6 $\frac{1}{2}$	
14. 1 3 7 $\frac{1}{2}$	2 9 4	1 17 2 $\frac{1}{4}$	1 12 4 $\frac{1}{2}$	4 16 2 $\frac{3}{4}$	
15. 1 2 6 $\frac{3}{4}$	1 18 7 $\frac{1}{2}$	3 7 4 $\frac{1}{2}$	3 2 11 $\frac{1}{4}$	2 17 11 $\frac{3}{4}$	
16. 1 3 3	3 0 6 $\frac{3}{4}$	5 2 7 $\frac{1}{4}$	1 13 8 $\frac{1}{4}$	3 2 6 $\frac{1}{2}$	
17. £1. 13s. 9d.	18. £12.	19. £4. 19s. 10 $\frac{1}{2}$ d.	20. 16s. 9 $\frac{1}{2}$ d.		
21. 7s. 3 $\frac{1}{2}$ d.	22. 18s. 4 $\frac{1}{2}$ d.	23. £1. 16s. 10d.	24. 12s. 8d.		

#### MULTIPLICATION OF MONEY—THE COLUMN METHOD

##### *Blackboard Work*

<p>(1)</p> <table> <tr><th>£</th><th>s.</th><th>d.</th></tr> <tr><td>11</td><td>19</td><td>0</td></tr> <tr><td colspan="3">× 7</td></tr> <tr><td>83</td><td>13</td><td>0</td></tr> <tr><td colspan="3"><hr/></td></tr> <tr><td>6</td><td>20</td><td>133</td></tr> <tr><td colspan="3">+ 77</td></tr> <tr><td>83</td><td>£6</td><td>13s.</td></tr> </table>	£	s.	d.	11	19	0	× 7			83	13	0	<hr/>			6	20	133	+ 77			83	£6	13s.	<p>(2)</p> <table> <tr><th>£</th><th>s.</th><th>d.</th></tr> <tr><td>1</td><td>10</td><td></td></tr> <tr><td colspan="3">× 11</td></tr> <tr><td>1</td><td>0</td><td>2</td></tr> <tr><td colspan="3"><hr/></td></tr> <tr><td>9</td><td>12</td><td>110</td></tr> <tr><td colspan="3">+ 11</td></tr> <tr><td>20</td><td colspan="2">9s. 2d.</td></tr> </table>	£	s.	d.	1	10		× 11			1	0	2	<hr/>			9	12	110	+ 11			20	9s. 2d.		<p>(3)</p> <table> <tr><th>£</th><th>s.</th><th>d.</th><th>f.</th></tr> <tr><td></td><td>7</td><td></td><td><math>\frac{3}{4}</math></td></tr> <tr><td colspan="4">× 41</td></tr> <tr><td>1</td><td>6</td><td>5</td><td><math>\frac{3}{4}</math></td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td></td><td>30</td><td>4</td><td>123</td></tr> <tr><td colspan="4">+ 287</td></tr> <tr><td>12</td><td>317</td><td colspan="2"></td></tr> <tr><td colspan="2"><hr/></td><td colspan="2">26s. 5d.</td></tr> </table>	£	s.	d.	f.		7		$\frac{3}{4}$	× 41				1	6	5	$\frac{3}{4}$	<hr/>					30	4	123	+ 287				12	317			<hr/>		26s. 5d.	
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<p>(4)</p> <p><i>Note:</i> Spread the work out as shown.</p>	<table> <tr><th>£</th><th>s.</th><th>d.</th><th>f.</th></tr> <tr><td></td><td>2</td><td>5</td><td><math>\frac{1}{4}</math></td></tr> <tr><td colspan="4">× 21</td></tr> <tr><td>2</td><td>11</td><td>2</td><td><math>\frac{1}{4}</math></td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td>9</td><td>5</td><td>4</td><td>21</td></tr> <tr><td colspan="4">+ 42</td></tr> <tr><td colspan="4">+ 105</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td>20</td><td>51</td><td>12</td><td>110</td></tr> <tr><td colspan="4">£2. 11s. 9s. 2d.</td></tr> </table>	£	s.	d.	f.		2	5	$\frac{1}{4}$	× 21				2	11	2	$\frac{1}{4}$	<hr/>				9	5	4	21	+ 42				+ 105				<hr/>				20	51	12	110	£2. 11s. 9s. 2d.				<table> <tr><td colspan="4"><hr/></td></tr> <tr><td colspan="4">5<math>\frac{1}{4}</math>d.</td></tr> </table>	<hr/>				5 $\frac{1}{4}$ d.																																			
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*Note:* Spread the work out as shown.

## Exercise 37

### Shopping

#### TO-DAY'S PRICES

##### The Baker's List

Bread: White loaf,  $4\frac{1}{2}d.$  each.  
 Bread: Brown or white cob,  $2d.$  each.  
 Bread: Plum  $\left\{ \begin{array}{l} \text{small loaf, } 9d. \text{ each.} \\ \text{large loaf, } 1s. 6d. \text{ each.} \end{array} \right.$   
 Small cakes (fancies),  $1d.$  each.  
 Slab cake, per lb.,  $9d.$   
 Pastries:  $1d.$  each or 7 for  $6d.$   
 Flour, per 14 lb.,  $1s. 10d.$

##### The Chandler's List

Soap  $\left\{ \begin{array}{l} \text{Sunlight, per lb., } 5\frac{1}{2}d. \\ \text{Lifebuoy, per 12 oz., } 5d. \end{array} \right.$   
 Rinso  $\left\{ \begin{array}{l} \text{per small packet, } 3\frac{1}{2}d. \\ \text{per large packet, } 10d. \end{array} \right.$   
 Vim  $\left\{ \begin{array}{l} \text{per packet, } 2d. \\ \text{per tin, } 6d. \end{array} \right.$   
 Metal polish, per tin,  $7\frac{1}{2}d.$   
 Washing soda, per 14 lb.,  $1s.$   
 Furniture cream, per bottle,  $4\frac{1}{2}d.$   
 Paraffin, per qt.,  $3d.$ ; per gall.,  $11d.$

Work the sums below, taking the prices from "the list". Find the total in each case.

1. 2 white loaves.  
    1 small loaf, plum-bread.  
    14 pastries.  
    5 brown cobs.
2.  $1\frac{1}{2}$  dozen small cakes.  
     $\frac{1}{2}$  lb. of slab cake.  
    3 white loaves.  
    1 large loaf, plum-bread.
3. Monday: 3 white loaves.  
    Tuesday: 7 lb. flour.  
    Wednesday: 14 pastries.  
    Thursday: 2 white loaves.  
    Friday: 3 cobs (brown).  
    Saturday:  $\left\{ \begin{array}{l} 4 \text{ white loaves.} \\ \frac{1}{2} \text{ lb. slab cake.} \\ 3\frac{1}{2} \text{ lb. flour.} \end{array} \right.$
4. Monday: 4 white loaves.  
    Tuesday:  $3\frac{1}{2}$  lb. flour.  
    Wednesday: 7 pastries and 2 cobs.  
    Thursday: 3 white loaves.  
    Friday:  $1\frac{1}{2}$  dozen small cakes.  
    Saturday:  $\left\{ \begin{array}{l} 5 \text{ white loaves.} \\ 7 \text{ lb. of flour.} \\ 1\frac{1}{2} \text{ lb. slab cake.} \end{array} \right.$
5. 3 small packets of Rinso.  
    1 tin of metal polish.  
     $3\frac{1}{2}$  lb. of washing soda.  
    1 qt. of paraffin.  
    3 bars of Lifebuoy soap (12 oz.)
6. 2 large packets of Rinso.  
    3 bottles of furniture cream.  
    2 tins of metal polish.  
    2 lb. of Sunlight soap.  
     $\frac{1}{2}$  gall. of paraffin.
7. 3 pints of paraffin.  
    21 lb. of washing soda.  
    3 lb. of Sunlight soap.  
    2 tins of metal polish.  
    3 packets of Vim.  
    3 small packets of Rinso.
8. 4 bars of Lifebuoy soap (12 oz.).  
     $1\frac{1}{2}$  gall. of paraffin.  
    3 bottles of furniture cream.  
     $10\frac{1}{2}$  lb. of washing soda.  
    3 tins of metal polish.  
    5 small packets of Rinso.

## Exercise 37

### Shopping

#### ANSWERS

- |            |            |              |            |
|------------|------------|--------------|------------|
| 1. 3s. 4d. | 2. 4s. 6d. | 3. 6s. 7½d.  | 4. 9s. 4d. |
| 5. 3s. 3d. | 6. 5s. 5d. | 7. 5s. 10½d. | 8. 8s. 3d. |

Keep Shopping Sums up-to-date. See page 16a.

#### SHOPPING. ORAL EXERCISES

##### (a) Order

1. 3 loaves at 4½d. each. (1s. 1½d.)
2. ¼ pint of cream at 2s. 6d. a pint. (7½d.)
3. 3 quarts of milk at 3½d. a pint. (1s. 9d.)
4. 1½ gall. of paraffin at 3d. a quart. (1s. 6d.)
5. 1¼ lb. of butter at 1s. 6d. a lb. (1s. 10½d.)
6. 2 dozen eggs at 1½d. each. (3s.)
7. 1½ lb. of sweets at ½d. an oz. (1s.)
8. ¼ lb. of chocolates at 3s. 10d. a lb. (11½d.)
9. 2 dozen pastries at ½d. each. (1s.)
10. 1 gross of lead pencils at 1½d. each. (18s.)
11. 1 yd. 1 ft. 6 in. at 9d. a yard. (1s. 1½d.)
12. 1 lb. 2 oz. of bacon at 1s. 4d. a lb. (1s. 6d.)
13. 2 oz. of pepper at 2s. 8d. a lb. (4d.)
14. ½ pt. of vinegar at 2s. a gall. (1½d.)

##### (b) Change

- From 2s. (10½d.)
- From 1s. (4½d.)
- From 2s. 6d. (9d.)
- From 2s. (6d.)
- From 2s. 6d. (7½d.)
- From 10s. (7s.)
- From 2s. 6d. (1s. 6d.)
- From 2s. (1s. 0½d.)
- From 10s. (9s.)
- From £1. (2s.)
- From 2s. 6d. (1s. 4½d.)
- From 2s. (6d.)
- From 1s. (8d.)
- From 6d. (4½d.)

#### PRACTICAL WORK IN SHOPPING

Pupils to be shop-keeper and customer in turn.

1. 1 pint of paraffin at 1s. a gall. (Measure 1 pt. of coloured water, receive 1s., and give 10½d. change.)
2. 2½ yd. of ribbon at 5d. a yard. (Measure 2½ yd. of string, receive 2s. 6d., and give 1s. 5½d. change.)
3. 1½ lb. butter at 1s. 5d. a lb. (Weigh out 1½ lb. plasticine, receive 2s. 6d., and give 4½d. change.)

Note the shop method of giving change: 1s. 5½d. goods and ½d. (1s. 6d.) and 1s. (2s. 6d.)

## Exercise 38

### Weights and Measures. Addition and Subtraction

#### A. LENGTH

- |                                 | (a)  | (b)           | (c)         | (d)               |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
|---------------------------------|--|---------------|-------------|-------------------|---|---|---|--|-----|-----|---|---|---|---|--|-----|-----|---|---|---|---|--|-----|-----|-----|---|---|---|---|---|---|
| 1. Change to inches:            | 3 ft. 7 in.  | 1 ft. 10½ in. | 1 yd. 2 ft. | 2 yd. 1 ft. 5 in. |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| 2. Change to ft. and in.:       | 59 in.   | 73 in.        | 49¼ in.     | 117 in.           |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| 3. Change to yd. ft. and in.:   | 73 in.   | 91 in.        | 87 in.      | 131 in.           |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| 4. First add; then take away: } | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">ft.</td> <td style="text-align: right;">in.</td> </tr> <tr> <td style="text-align: right;">3</td> <td style="text-align: right;">7</td> </tr> <tr> <td style="text-align: right;">1</td> <td style="text-align: right;">9</td> </tr> </table> | ft.           | in.         | 3                 | 7 | 1 | 9 | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">ft.</td> <td style="text-align: right;">in.</td> </tr> <tr> <td style="text-align: right;">5</td> <td style="text-align: right;">5</td> </tr> <tr> <td style="text-align: right;">3</td> <td style="text-align: right;">7</td> </tr> </table> | ft. | in. | 5 | 5 | 3 | 7 | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">yd.</td> <td style="text-align: right;">ft.</td> </tr> <tr> <td style="text-align: right;">3</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">1</td> <td style="text-align: right;">2</td> </tr> </table> | yd. | ft. | 3 | 0 | 1 | 2 | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">yd.</td> <td style="text-align: right;">ft.</td> <td style="text-align: right;">in.</td> </tr> <tr> <td style="text-align: right;">2</td> <td style="text-align: right;">1</td> <td style="text-align: right;">5</td> </tr> <tr> <td style="text-align: right;">1</td> <td style="text-align: right;">2</td> <td style="text-align: right;">7</td> </tr> </table> | yd. | ft. | in. | 2 | 1 | 5 | 1 | 2 | 7 |
| ft.                             | in.  |               |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| 3                               | 7  |               |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| 1                               | 9  |               |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| ft.                             | in.  |               |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| 5                               | 5  |               |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| 3                               | 7  |               |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| yd.                             | ft.  |               |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| 3                               | 0  |               |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| 1                               | 2  |               |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| yd.                             | ft.  | in.           |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| 2                               | 1  | 5             |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
| 1                               | 2  | 7             |             |                   |   |   |   |  |     |     |   |   |   |   |  |     |     |   |   |   |   |  |     |     |     |   |   |   |   |   |   |
5. Find the difference between 3 yd. 1 ft. 2 in. and 7 yd. 0 ft. 1 in.
  6. Silver wire is 10½d. an inch. Find the cost of 1 yd. 1 ft. 3 in. of wire.
  7. A 60-inch tape measure was cut into 2 pieces. One piece was 2 ft. 11 in. long. Find the length of the other piece.
  8. A grass plot is 6 yd. 2 ft. long and 4 yd. 2 ft. 3 in. wide. Find (a) the difference between the length and the width; (b) the distance all round.

#### B. WEIGHT

- |                                 | (a)  | (b)            | (c)            | (d)             |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
|---------------------------------|--|----------------|----------------|-----------------|----|---|----|--|------|------|---|----|---|----|--|------|------|----|----|---|----|--|------|------|----|---|----|----|
| 1. Change to oz.:               | 1 lb. 7 oz.  | 2 lb. 9 oz.    | 7 lb. 11 oz.   | 5 lb. 13¼ oz.   |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 2. Change to lb. oz.:           | 73 oz.   | 81 oz.         | 101 oz.        | 121 oz.         |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 3. Change to cwt.:              | 1 ton 7 cwt.   | 2 tons 11 cwt. | 4 tons 19 cwt. | 7 tons 11½ cwt. |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 4. Change to tons and cwt.:     | 31 cwt.  | 49 cwt.        | 119 cwt.       | 217 cwt.        |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 5. First add; then take away: } | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">lb.</td> <td style="text-align: right;">oz.</td> </tr> <tr> <td style="text-align: right;">11</td> <td style="text-align: right;">5</td> </tr> <tr> <td style="text-align: right;">3</td> <td style="text-align: right;">12</td> </tr> </table>   | lb.            | oz.            | 11              | 5  | 3 | 12 | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">lb.</td> <td style="text-align: right;">oz.</td> </tr> <tr> <td style="text-align: right;">9</td> <td style="text-align: right;">12</td> </tr> <tr> <td style="text-align: right;">5</td> <td style="text-align: right;">13</td> </tr> </table>   | lb.  | oz.  | 9 | 12 | 5 | 13 | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">lb.</td> <td style="text-align: right;">oz.</td> </tr> <tr> <td style="text-align: right;">13</td> <td style="text-align: right;">12</td> </tr> <tr> <td style="text-align: right;">9</td> <td style="text-align: right;">15</td> </tr> </table>  | lb.  | oz.  | 13 | 12 | 9 | 15 | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">lb.</td> <td style="text-align: right;">oz.</td> </tr> <tr> <td style="text-align: right;">17</td> <td style="text-align: right;">8</td> </tr> <tr> <td style="text-align: right;">13</td> <td style="text-align: right;">9</td> </tr> </table>   | lb.  | oz.  | 17 | 8 | 13 | 9  |
| lb.                             | oz.  |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 11                              | 5  |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 3                               | 12   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| lb.                             | oz.  |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 9                               | 12   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 5                               | 13   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| lb.                             | oz.  |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 13                              | 12   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 9                               | 15   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| lb.                             | oz.  |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 17                              | 8  |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 13                              | 9  |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 6. First add; then take away: } | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">tons</td> <td style="text-align: right;">cwt.</td> </tr> <tr> <td style="text-align: right;">2</td> <td style="text-align: right;">11</td> </tr> <tr> <td style="text-align: right;">1</td> <td style="text-align: right;">13</td> </tr> </table> | tons           | cwt.           | 2               | 11 | 1 | 13 | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">tons</td> <td style="text-align: right;">cwt.</td> </tr> <tr> <td style="text-align: right;">7</td> <td style="text-align: right;">10</td> </tr> <tr> <td style="text-align: right;">3</td> <td style="text-align: right;">11</td> </tr> </table> | tons | cwt. | 7 | 10 | 3 | 11 | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">tons</td> <td style="text-align: right;">cwt.</td> </tr> <tr> <td style="text-align: right;">11</td> <td style="text-align: right;">3</td> </tr> <tr> <td style="text-align: right;">9</td> <td style="text-align: right;">17</td> </tr> </table> | tons | cwt. | 11 | 3  | 9 | 17 | <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="text-align: right;">tons</td> <td style="text-align: right;">cwt.</td> </tr> <tr> <td style="text-align: right;">13</td> <td style="text-align: right;">7</td> </tr> <tr> <td style="text-align: right;">3</td> <td style="text-align: right;">12</td> </tr> </table> | tons | cwt. | 13 | 7 | 3  | 12 |
| tons                            | cwt.   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 2                               | 11   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 1                               | 13   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| tons                            | cwt.   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 7                               | 10   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 3                               | 11   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| tons                            | cwt.   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 11                              | 3  |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 9                               | 17   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| tons                            | cwt.   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 13                              | 7  |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
| 3                               | 12   |                |                |                 |    |   |    |  |      |      |   |    |   |    |  |      |      |    |    |   |    |  |      |      |    |   |    |    |
7. Find the cost of 2 tons 10 cwt. of coal at 1s. 10d. per cwt.
  8. My coal-shed will hold 5 tons of coal. I purchase 1¾ tons from one coal dealer and 2½ tons from another. How much more coal is needed to fill the shed?
  9. John weighs 4 stones 6 lb. and his sister May weighs 3 stones 10 lb. Find (a) the difference between their weights; (b) the sum of their weights. (14 lb. = 1 stone weight.)



## Exercise 38

### Weights and Measures. Addition and Subtraction

#### ANSWERS

#### A

- | (a)                   | (b)               | (c)  | (d)                |
|-----------------------|-------------------|--|--------------------|
| 1. 43 in.             | 22½ in.           | 60 in.   | 89 in.             |
| 2. 4 ft. 11 in.       | 6 ft. 1 in.       | 4 ft. 1¼ in.                                     | 9 ft. 9 in.        |
| 3. 2 yd. 1 in.        | 2 yd. 1 ft. 7 in. | 2 yd. 1 ft. 3 in.                                | 3 yd. 1 ft. 11 in. |
| 4. { 5 ft. 4 in.      | 9 ft. 0 in.       | 4 yd. 2 ft.                                      | 4 yd. 1 ft.        |
| { 1 ft. 10 in.        | 1 ft. 10 in.      | 1 yd. 1 ft.                                      | 1 ft. 10 in.       |
| 5. 3 yd. 1 ft. 11 in. |                   | 6. £2. 4s. 7½d.                                  |                    |
| 7. 2 ft. 1 in.        |                   | 8. (a) 1 yd. 2 ft. 9 in.; (b) 22 yd. 2 ft. 6 in. |                    |

#### B

- | (a)                | (b)            | (c)                            | (d)             |
|--------------------|----------------|--------------------------------|-----------------|
| 1. 23 oz.          | 41 oz.         | 123 oz.                        | 93¼ oz.         |
| 2. 4 lb. 9 oz.     | 5 lb. 1 oz.    | 6 lb. 5 oz.                    | 7 lb. 9 oz.     |
| 3. 27 cwt.         | 51 cwt.        | 99 cwt.                        | 151½ cwt.       |
| 4. 1 ton 11 cwt.   | 2 tons 9 cwt.  | 5 tons 19 cwt.                 | 10 tons 17 cwt. |
| 5. { 15 lb. 1 oz.  | 15 lb. 9 oz.   | 23 lb. 11 oz.                  | 31 lb. 1 oz.    |
| { 7 lb. 9 oz.      | 3 lb. 15 oz.   | 3 lb. 13 oz.                   | 3 lb. 15 oz.    |
| 6. { 4 tons 4 cwt. | 11 tons 1 cwt. | 21 tons 0 cwt.                 | 16 tons 19 cwt. |
| { 18 cwt.          | 3 tons 19 cwt. | 1 ton 6 cwt.                   | 9 tons 15 cwt.  |
| 7. £4. 11s. 8d.    | 8. 15 cwt.     | 9. (a) 10 lb.; (b) 8 st. 2 lb. |                 |

### REDUCTION TABLES. WEIGHTS AND MEASURES

(a) <i>Weight</i>	(b) <i>Weight</i>	(c) <i>Length</i>					
ounces (oz.)	lb.	inches (in.)					
<table style="border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">16</td> <td style="border: none; padding: 0 10px;">pounds (lb.)</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">224</td> <td style="border: none; padding: 0 10px;">14</td> </tr> </table>	16	pounds (lb.)	224	14	1 stone		
16	pounds (lb.)						
224	14						
	<table style="border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">112</td> <td style="border: none; padding: 0 10px;">cwt.</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">2240</td> <td style="border: none; padding: 0 10px;">20</td> </tr> </table>	112	cwt.	2240	20	1 ton	
112	cwt.						
2240	20						
		<table style="border-collapse: collapse;"> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">12</td> <td style="border: none; padding: 0 10px;">feet (ft.)</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px; text-align: center;">36</td> <td style="border: none; padding: 0 10px;">3</td> </tr> </table>	12	feet (ft.)	36	3	1 yard
12	feet (ft.)						
36	3						

#### Downward Reduction

Ex. 1 st. 3 lb. 12 oz. to oz.

×	224	
	224	
+	48 (3 lb.)	
+	12	
	<u>284</u>	

#### Upward

Ex. Change 300 oz. to stones, lb., oz.

16   300 oz.	18 lb.
14   18 lb. 12 oz.	16   300
	<u>1 st. 4 lb. 12 oz.</u>
	16
	<u>140</u>
	128

### ORAL EXAMPLES ON THE TABLES

- How many oz. in (a) 1 stone? (224); (b) 1 st. 1 lb.? (224 + 16 = 240); etc.
- How many lb. and oz. in (a) 27 oz.? (1 lb. 11 oz.); (b) 40 oz.? (2 lb. 8 oz.) 55 oz.? (3 lb. 7 oz.); etc.
- How many lb. in 1 cwt.? (112); 1½ cwt.? (168); 1 cwt. 50 lb.? (162 lb.); etc.

## Exercise 39

### Weights and Measures (cont.). Addition and Subtraction

#### A. CAPACITY

- |                                 | (a)               | (b)               | (c)               | (d)                   |
|---------------------------------|-------------------|-------------------|-------------------|-----------------------|
| 1. Change to pints:             | 1 qt. 1 pt.       | 3 qt. 1 pt.       | 1 gall. 1 pt.     | 2 gall. 3 qt. 1 pt.   |
| 2. Change to qt. and pt.:       | 7 pt.             | 11 pt.            | 33 pt.            | 57 pt.                |
| 3. Change to gall. and qt.:     | 13 qt.            | 27 qt.            | 31 qt.            | 59 qt.                |
| 4. Change to gall. qt. and pt.: | 37 pt.            | 49 pt.            | 53 pt.            | 87 pt.                |
|                                 | qt. pt.           | qt. pt.           | gall. qt.         | gall. qt. pt.         |
| 5. First add; then subtract:    | 4 1<br><u>3 1</u> | 7 0<br><u>3 1</u> | 7 1<br><u>3 3</u> | 7 1 0<br><u>3 2 1</u> |
6. A milkman served 117 people, each with 1 pint of milk, 93 people, each with 1 quart and had 1 gall. 1 pt. left. How much milk had he at first?
7. One cask contains 12 gall. 1 qt. of vinegar and another contains 11 gall. 2 qt. 1 pt. Find (a) the quantity of vinegar in the two casks; (b) the difference in quantity they contain.

#### B. TIME

- |                              | (a)                  | (b)                   | (c)                 | (d)                   |
|------------------------------|----------------------|-----------------------|---------------------|-----------------------|
| 1. Change to min.:           | 1 hr. 35 min.        | 3 hr. 12 min.         | 4 hr. 45 min.       | 5½ hr.                |
| 2. Change to hr. and min:    | 127 min.             | 216 min.              | 372 min.            | 519 min.              |
| 3. Change to hours:          | 1 dy. 17 hr.         | 2 dy. 11 hr.          | 3 dy. 19 hr.        | 4 dy. 23 hr.          |
| 4. Change to dy. and hr.:    | 111 hr.              | 157 hr.               | 231 hr.             | 317 hr.               |
| 5. Change to days:           | 3 wk. 2 dy.          | 5 wk. 6 dy.           | 12 wk. 4 dy.        | 13 wk. 5 dy.          |
| 6. Change to wk. and days:   | 37 dy.               | 50 dy.                | 112 dy.             | 137 dy.               |
|                              | hr. min.             | hr. min.              | dy. hr.             | dy. hr.               |
| 7. First add; then subtract: | 17 21<br><u>7 23</u> | 21 43<br><u>15 52</u> | 7 17<br><u>2 18</u> | 11 12<br><u>7 20</u>  |
|                              | wk. dy.              | wk. dy.               | wk. dy.             | dy. hr.               |
| 8. First add; then subtract: | 11 3<br><u>2 5</u>   | 21 5<br><u>17 6</u>   | 19 4<br><u>13 5</u> | 23 11<br><u>17 21</u> |
9. The 10.35 a.m. train arrived at 1 p.m. How many hours and minutes did it take?
10. Jane went to bed at 9 p.m. and slept until 7.30 a.m. next morning. How long was that?
11. (a) How many hours are there in 1 week? (b) How many hours are there in the month of June?
12. School commences at 9 and goes on until noon. Then there are 1½ hours for dinner before the afternoon school begins. Afternoon school ends at 4 p.m. How many hours and minutes are there in a school day?

## Exercise 39

### Weights and Measures (cont.). Addition and Subtraction

#### ANSWERS

#### A

- | (a)  | (b)           | (c)                 | (d)                  |
|--|---------------|---------------------|----------------------|
| 1. 3 pt.   | 7 pt.         | 9 pt.               | 23 pt.               |
| 2. 3 qt. 1 pt.   | 5 qt. 1 pt.   | 16 qt. 1 pt.        | 28 qt. 1 pt.         |
| 3. 3 gall. 1 qt.   | 6 gall. 3 qt. | 7 gall. 3 qt.       | 14 gall. 3 qt.       |
| 4. 4 gall. 2 qt. 1 pt.   | 6 gall. 1 pt. | 6 gall. 2 qt. 1 pt. | 10 gall. 3 qt. 1 pt. |
| 5. $\left\{ \begin{array}{l} 8 \text{ qt.} \\ 1 \text{ qt.} \end{array} \right.$ | 10 qt. 1 pt.  | 11 gall.            | 10 gall. 3 qt. 1 pt. |
| 6. 39 gall.  | 3 qt. 1 pt.   | 3 gall. 2 qt.       | 3 gall. 2 qt. 1 pt.  |
| 7. (a) 23 gall. 3 qt. 1 pt.; (b) 2 qt. 1 pt.                                     |               |                     |                      |

#### B

- | (a)   | (b)                | (c)                          | (d)               |
|---|--------------------|------------------------------|-------------------|
| 1. 95 min.  | 192 min.           | 285 min.                     | 315 min.          |
| 2. 2 hr. 7 min.   | 3 hr. 36 min.      | 6 hr. 12 min.                | 8 hr. 39 min.     |
| 3. 41 hr.   | 59 hr.             | 91 hr.                       | 119 hr.           |
| 4. 4 dy. 15 hr.   | 6 dy. 13 hr.       | 9 dy. 15 hr.                 | 13 dy. 5 hr.      |
| 5. 23 dy.   | 41 dy.             | 88 dy.                       | 96 dy.            |
| 6. 5 wk. 2 dy.  | 7 wk. 1 dy.        | 16 wk.                       | 19 wk. 4 dy.      |
| 7. $\left\{ \begin{array}{l} 24 \text{ hr. 44 min.} \\ 9 \text{ hr. 58 min.} \end{array} \right.$ | 37 hr. 35 min.     | 10 dy. 11 hr.                | 19 dy. 8 hr.      |
|   | 5 hr. 51 min.      | 4 dy. 23 hr.                 | 3 dy. 16 hr.      |
| 8. $\left\{ \begin{array}{l} 14 \text{ wk. 1 dy.} \\ 8 \text{ wk. 5 dy.} \end{array} \right.$     | 39 wk. 4 dy.       | 33 wk. 2 dy.                 | 41 dy. 8 hr.      |
|   | 3 wk. 6 dy.        | 5 wk. 6 dy.                  | 5 dy. 14 hr.      |
| 9. 2 hr. 25 min.  | 10. 10 hr. 30 min. | 11. (a) 168 hr.; (b) 720 hr. | 12. 5 hr. 30 min. |

### REDUCTION TABLES. CAPACITY AND TIME

#### (a) Capacity

half-pints			
2	pints (pt.)		
4	2	quarts (qt.)	
16	8	4	1 gall.

#### (b) Time

		minutes (min.)
		60
hours (hr.)		
24	1440	
days (dy.)		
7	168	<div style="border: 1px solid black; width: 100px; height: 100px; margin: 0 auto; position: relative;"> <div style="position: absolute; top: 0; left: 0; right: 0; bottom: 0; border: 1px solid black; transform: rotate(45deg);"></div> <div style="position: absolute; top: 0; right: 0; left: 0; bottom: 0; border: 1px solid black; transform: rotate(-45deg);"></div> </div>

#### Downward Reduction

(Omit intermediate steps)

*Ex.:*      2 gall. 3 qt. 1 pt. to pt.

8

---

16

---

7

---

23 pt.

#### Upward Reduction

(One step at a time)

*Ex.:* Change 373 pt. to gall., qt., and pt.

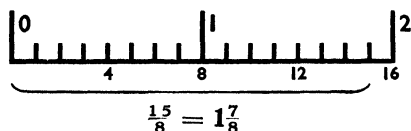
2  $\overline{) 373}$  pt.

4  $\overline{) 186}$  qt. 1 pt.

46 gall. 2 qt. 1 pt.

## Exercise 40

### Fractions and Work in Fractions



1. Examine the diagram. Then test the following, using your ruler:  $\frac{7}{4} = 1 \frac{3}{4}$ ;  $\frac{9}{2} = 4 \frac{1}{2}$ ;  $\frac{9}{8} = 1 \frac{1}{8}$ .
2. Write in another form: (a)  $\frac{3}{2}$ ,  $\frac{7}{3}$ ,  $\frac{13}{8}$ ,  $\frac{9}{4}$ ,  $\frac{7}{5}$ ,  $\frac{11}{9}$ ,  $\frac{7}{6}$ ; (b)  $1 \frac{2}{3}$ ,  $2 \frac{1}{2}$ ,  $1 \frac{3}{8}$ ,  $1 \frac{1}{3}$ ,  $1 \frac{4}{9}$ ,  $1 \frac{5}{6}$ ,  $3 \frac{1}{3}$ .

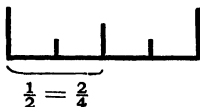


Fig. 1.

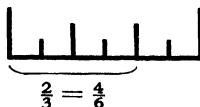
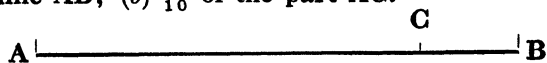


Fig. 2.

3. Examine figs. 1 and 2. Then test the following (you may use your ruler):  $\frac{1}{4} = \frac{3}{12}$ ;  $\frac{2}{3} = \frac{4}{6}$ ;  $\frac{6}{12} = \frac{3}{6} = \frac{1}{2}$ .
4. Fill in the missing figures:  $\frac{6}{12} = \frac{?}{2}$ ;  $\frac{9}{12} = \frac{?}{4}$ ;  $\frac{3}{12} = \frac{?}{4}$ ;  $\frac{2}{6} = \frac{?}{3}$ ;  $\frac{6}{8} = \frac{?}{4}$ ;  $\frac{4}{8} = \frac{?}{2}$ ;  $\frac{2}{8} = \frac{?}{4}$ .
5. How many sixths in  $\frac{1}{3}$ ; in  $\frac{1}{2}$ ; in  $\frac{1}{3} + \frac{1}{2}$ ; in  $\frac{1}{2} - \frac{1}{3}$ ?
6. How many eighths in  $\frac{1}{2}$ ; in  $\frac{1}{4}$ ; in  $\frac{1}{8}$ ; in  $\frac{1}{2} + \frac{1}{4} + \frac{1}{8}$ ; in  $\frac{1}{2} - \frac{1}{8}$ ?
7. Change to twelfths and add: (a)  $\frac{1}{2}$ ,  $\frac{7}{12}$ ; (b)  $\frac{2}{3}$ ,  $\frac{5}{12}$ ; (c)  $\frac{3}{4}$ ,  $\frac{1}{6}$ ; (d)  $\frac{1}{4}$ ,  $\frac{5}{6}$ .
8. (a)  $\frac{1}{2} + \frac{3}{8}$ ; (b)  $\frac{1}{3} + \frac{1}{4}$ ; (c)  $\frac{3}{4} + \frac{1}{2}$ ; (d)  $\frac{1}{2} + \frac{2}{3}$ ; (e)  $\frac{5}{6} + \frac{1}{2}$ ; (f)  $\frac{3}{4} - \frac{2}{3}$ ; (g)  $\frac{5}{6} - \frac{7}{12}$ .
9. (a) Change to eighths and add:  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ ; (b) change to sixths and add:  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{6}$ .

ONE WHOLE									
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$

10. How many tenths in  $\frac{1}{5}$ ,  $\frac{2}{5}$ ,  $\frac{3}{5}$ ,  $\frac{4}{5}$ ,  $\frac{1}{2}$ ?
11. Change to tenths and add: (a)  $\frac{1}{5}$ ,  $\frac{1}{10}$ ; (b)  $\frac{2}{5}$ ,  $\frac{1}{10}$ ; (c)  $\frac{3}{5}$ ,  $\frac{3}{10}$ ; (d)  $\frac{1}{5}$ ,  $\frac{7}{10}$ .
12. Find (a)  $\frac{2}{5}$  of line AB; (b)  $\frac{3}{10}$  of the part AC.



13. What part of the whole line is (a) CB; (b) AC?
14. Change to twelfths and then arrange the fractions in order of value, putting the smallest first: (a)  $\frac{2}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ ; (b)  $\frac{3}{4}$ ,  $\frac{5}{6}$ ,  $\frac{2}{3}$ ; (c)  $\frac{1}{4}$ ,  $\frac{1}{3}$ ,  $\frac{1}{6}$ ; (d)  $\frac{7}{12}$ ,  $\frac{2}{3}$ ,  $\frac{3}{4}$ ,  $\frac{1}{2}$ ,  $\frac{5}{6}$ .
15. Find (a)  $\frac{1}{3}$ ; (b)  $\frac{3}{10}$ ; (c)  $\frac{1}{2}$ ; (d)  $\frac{3}{4}$  of 6 tons.
16. Find (a)  $\frac{1}{3}$ ; (b)  $\frac{7}{10}$ ; (c)  $\frac{1}{2}$ ; (d)  $\frac{3}{8}$ ; (e)  $\frac{3}{4}$ ; (f)  $\frac{2}{3}$ ; (g)  $\frac{5}{12}$  of £3. 10s.

## Exercise 40

### Fractions and Work on Fractions

#### ANSWERS

1. —.      2. (a)  $1\frac{1}{2}$ ,  $2\frac{1}{3}$ ,  $1\frac{5}{8}$ ,  $2\frac{1}{4}$ ,  $1\frac{2}{3}$ ,  $1\frac{2}{9}$ ,  $1\frac{1}{8}$ ; (b)  $\frac{5}{8}$ ,  $\frac{5}{2}$ ,  $\frac{11}{8}$ ,  $\frac{8}{5}$ ,  $\frac{13}{9}$ ,  $\frac{11}{6}$ ,  $\frac{10}{3}$ .      3. —.
4. —.      5. 2; 3; 5; 1.      6. 4; 2; 1; 7; 3.      7. (a)  $1\frac{1}{12}$ ; (b)  $1\frac{1}{12}$ ; (c)  $\frac{11}{12}$ ; (d)  $1\frac{1}{12}$ .
8. (a)  $\frac{7}{8}$ ; (b)  $\frac{7}{12}$ ; (c)  $1\frac{1}{4}$ ; (d)  $1\frac{1}{8}$ ; (e)  $1\frac{1}{3}$ ; (f)  $\frac{1}{12}$ ; (g)  $\frac{1}{4}$ .      9. (a)  $\frac{7}{8}$ ; (b) 1.
10. 2; 4; 6; 8; 5.      11. (a)  $\frac{3}{10}$ ; (b)  $\frac{1}{2}$ ; (c)  $\frac{9}{10}$ ; (d)  $\frac{9}{10}$ .
12. (a)  $1\frac{1}{2}$  in.; (b)  $\frac{6}{10}$  in.      13.  $\frac{1}{5}$ ;  $\frac{4}{5}$ .
14. (a)  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ ; (b)  $\frac{2}{3}$ ,  $\frac{3}{4}$ ,  $\frac{5}{6}$ ; (c)  $\frac{1}{6}$ ,  $\frac{1}{4}$ ,  $\frac{1}{3}$ ; (d)  $\frac{1}{2}$ ,  $\frac{7}{12}$ ,  $\frac{2}{3}$ ,  $\frac{3}{4}$ ,  $\frac{5}{6}$ .
15. (a) 1 ton 4 cwt.; (b) 1 ton 16 cwt.; (c) 3 tons; (d)  $4\frac{1}{2}$  tons.
16. (a) 14s.; (b) £2. 9s.; (c) £1. 15s.; (d) £1. 6s. 3d.; (e) £2. 12s. 6d.; (f) £2. 6s. 8d.; (g) £1. 9s. 2d.

#### FRACTIONS

Practical Work. See page 26a.

Revision Work. Revise (a) halves, fourths, and eighths; (b) thirds, sixths, and twelfths; (c) definitions of "a fraction", numerator, and denominator.

New Work. (a) Fifths and tenths (practical work);

(b) Changing improper fractions to mixed numbers and vice versa. (Practical work, see No. 1, pupil's page);

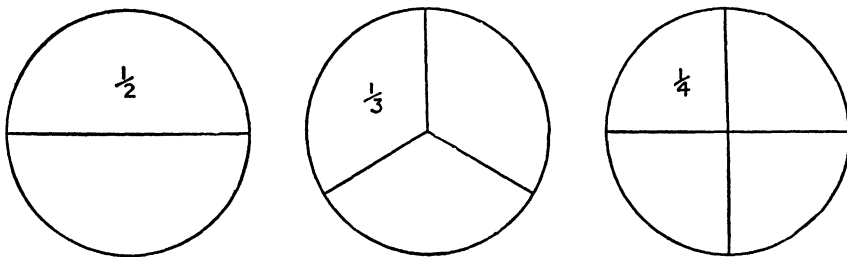
(c) Reducing fractions to lowest terms. (No mention of the word "cancelling"—practical work, see No. 2, pupil's page);

(d) Addition and subtraction—fractions reduced to a common denominator;

(e) Arranging fractions in order of value—fractions reduced to a common denominator.

#### COMPARISON OF FRACTIONS

(Practical Work)



$\frac{1}{2}$  is greater than  $\frac{1}{3}$ , and  $\frac{1}{2}$  is greater than  $\frac{1}{4}$ . Similarly,  $\frac{1}{3}$  is greater than  $\frac{1}{4}$ ; etc.

If  $\frac{1}{3}$  is bigger than  $\frac{1}{4}$  ( $\frac{1}{3}$ ), then,  $\frac{2}{3}$  is bigger than  $\frac{2}{4}$  ( $\frac{1}{2}$ ); etc.

If the numerators of the fractions are alike, the biggest fraction is the one with the least denominator. Why?

To compare fractions, first reduce them to a common denominator.

## Exercise 41

### Revision

- Write answers only: (a)  $12 \times 11$ ; (b)  $13 + 17 + 25$ ; (c)  $100 - 29$ ; (d)  $129d.$ ; (e)  $\pounds 1 - 13s. 7\frac{1}{2}d.$ ; (f) 91 farthings; (g) 3 score  $-$  3 dozen; (h)  $131 \times 70$ ; (k) 3 dozen at  $3\frac{1}{2}d.$  each; (l) 1 ton at  $1s. 9d.$  a cwt.
- From nine thousand and nine take two thousand and seventy-nine.
- Father is paid at the rate of  $1s. 6d.$  an hour. How many hours must he work to earn  $\pounds 1. 10s.$ ?
- Count by elevenpences from  $3s. 9d.$  to  $11s. 10d.$  Set your work out, as:  $3s. 9d., 4s. 8d., 5s. 7d.,$  etc.
- Wireless sets are bought at  $\pounds 3. 11s. 6d.$  and sold at  $\pounds 4. 10s.$  Find the profit on 11 sets bought and sold.
- Add the sum of 3,211 and 1,919 to their difference.
- Tom left home at 2.20 p.m. and returned  $1\frac{3}{4}$  hours later. What was the time when he arrived home?
- (a)  $79 \times 36$ ; (b)  $1,745 \div 37$ ; (c)  $129 \times 23$ ; (d)  $7,413 \div 54$ ; (e)  $9,001 - 7,223$ .
- (a)  $\pounds 1. 1s. 3d. \times 12$ ; (b)  $1s. 9d. \times 23$ ; (c)  $1s. 8\frac{1}{4}d. \times 56$ ; (d)  $1s. 2\frac{1}{2}d. \times 21$ .
- Find the change out of  $\pounds 5$  after paying for 12 articles at  $7s. 11\frac{1}{2}d.$  each.
- A rectangle measures  $5\frac{1}{2}$  inches by  $3\frac{1}{4}$  inches. Find (a) the difference between the length and the breadth; (b) the distance all round (ft. and in.).
- If 5 chairs cost  $\pounds 4. 11s. 3d.$ , what would 9 chairs cost?
- (a)  $\frac{5}{8} + \frac{1}{2}$ ; (b)  $1\frac{1}{2} + \frac{3}{8}$ ; (c)  $\frac{7}{8} - \frac{1}{4}$ ; (d)  $1\frac{2}{3} + \frac{1}{2}$ ; (e)  $\frac{5}{6} - \frac{7}{12}$ .
- (a)  $2\frac{1}{4}$  lb. at  $1d.$  an oz. (b) 3 gall. 1 qt. at  $3\frac{1}{2}d.$  a pint.
- Find  $\frac{1}{8}$  of  $(3,216 + 1,739 - 979)$ .
- (a) 1 ft. 7 in. + 2 ft. 3 in. + 1 yd. 1 ft. 8 in. (b) 1 yd. 2 ft. 3 in.  $-$  2 ft. 7 in.
- (a) 7 lb. 6 oz. + 4 lb. 13 oz. + 7 oz. (b) 13 gall. 2 qt.  $-$  5 gall. 3 qt.
- (a)  $7,315 \div 60$ ; (b)  $121 \times 70$ ; (c)  $3,246 \div 200$ .
- $\pounds 13. 5s. 3\frac{1}{2}d. + \pounds 11. 19s. 4\frac{1}{2}d. + \pounds 9. 11s. 7\frac{3}{4}d. + \pounds 7. 13s. 5\frac{3}{4}d.$
- 34 stamps at  $3d.$  each + 115 at  $\frac{1}{2}d.$  each + 92 at  $1\frac{1}{2}d.$  each + 131 at  $1d.$  each.
- Write in another form: (a)  $\frac{7}{4}$ ; (b)  $\frac{19}{8}$ ; (c)  $\frac{7}{2}$ ; (d)  $\frac{13}{6}$ ; (e)  $\frac{11}{3}$ ; (f)  $\frac{12}{5}$ .
- A greengrocer bought 8 gross of bananas at  $4s. 6d.$  a gross. He sold  $\frac{1}{2}$  of them at  $9d.$  a dozen and the other half at 9 for  $1s.$  How much profit did he make?

## Exercise 41

### Revision

#### ANSWERS

1. (a) 132; (b) 55; (c) 71; (d) 10s. 9d.; (e) 6s. 4½d.; (f) 1s. 10½d.; (g) 24; (h) 9,170;  
(k) 10s. 6d.; (l) £1. 15s.      2. 6,930.      3. 20 hr.      4. —.
5. £10. 3s. 6d.      6. 6,422.      7. 4.5 p.m.      8. (a) 2,844; (b) 47 (6 R); (c) 2,967;  
(d) 137 (15 R); (e) 1,778.      9. (a) £12. 15s.; (b) £2. 0s. 3d.;  
(c) £4. 14s. 6d.; (d) £1. 5s. 4½d.      10. 4s. 6d.      11. (a) 2½ in.;  
(b) 1 ft. 5½ in.      12. £8. 4s. 3d.      13. (a) 1½; (b) 1½; (c) ⅝; (d) 2½; (e) ¼.
14. (a) 3s.; (b) 7s. 7d.      15. 497.      16. (a) 2 yd. 2 ft. 6 in.; (b) 2 ft. 8 in.
17. (a) 12 lb. 10 oz.; (b) 7 gall. 3 qt.      18. (a) 121 (55 R); (b) 8,470;  
(c) 16 (46 R).      19. £42. 9s. 9½d.      20. £1. 15s. 8½d.
21. (a) 1¾; (b) 2¾; (c) 3½; (d) 2½; (e) 3¾; (f) 2¾.      22. £5.

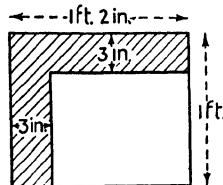
#### MISCELLANEOUS ORAL EXERCISES

- There are 12 sheep in one field and twice as many in another. How many in the two fields? (36.)
- A girl earns 5d. an hour. What will she earn in 4½ hr.? (1s. 10½d.)
- There are 100 pages in a book. If I read 8 pages a night for 9 nights, how many pages have I still to read? (28.)
- I pay for 7 bus tickets at 9½d. each with a 10s. note. How much change should I get? (4s. 5½d.)
- Oranges are 2 for 1½d. What must be paid for 2 dozen? (1s. 6d.)
- Mother buys 3 dozen oranges at 9d. a dozen. How much do they cost? (2s. 3d.)
- A pole is 5 ft. long. If 1 ft. 8 in. are cut from one end and 1 ft. 4 in. from the other end, what length is left? (2 ft.)
- Ten twopences + 15 threepences. (5s. 5d.)
- From £1 take 13s. 6½d. (6s. 5½d.)
- 11 + 12 + 13. (36.) How many short of 100? (64.)
- Add: 13, 13, and 13. (39.)
- Three 10s. notes + 5 half-crowns. (£2. 2s. 6d.)
- 200 nibs at two a 1d. (8s. 4d.)
- How many threehalfpenny stamps for 2s. 6d.? (20.)
- A boy had 39 sweets. He ate 7 and shared the remainder equally among 8 boys. How many for each boy? (4.)
- (a) 7½d. + 6½d. + 5½d. (1s. 7½d.); (b) 25s. + 10s. + 20s. (£2. 15s.).
- How many hours from 6 p.m. to 8.45 p.m.? (2¾.)

## Exercise 42

### Revision

1. (a) 5 yd. 2 ft. + 2 yd. 1 ft. + 3 yd. 2 ft.    (b) 5 yd. 1 ft. - 3 yd. 2 ft.
2. (a) 3 gall. 3 qt. + 7 qt. + 1 qt. 1 pt.    (b) 13 wk. 2 dy. - 7 wk. 5 dy.
3. (a) 2 st. 10 lb. + 1 st. 12 lb.    (b) 11 st. 3 lb. - 7 st. 13 lb.
4. (a) 17 tons 15 cwt. - 5 tons 16 cwt.    (b) 7 dy. 4 hr. - 3 dy. 20 hr.
5. A table top measures 6 ft. by 4 ft. Find (a) its area in sq. ft.; (b) the distance round, in yd. and ft.
6. (a)  $2,179 + 3,016 + 179 + 1,009$ ; (b)  $7,070 - 2,558$ ; (c)  $172 \times 43$ .
7. (a)  $2,759 \div 39$ ; (b) £13. 0s. 7d. - 17s.  $8\frac{1}{2}d.$ ; (c)  $2s. 5d. \times 27$ .
8. (a) What will  $2\frac{1}{2}$  lb. of tea cost at 8d. a  $\frac{1}{4}$  lb.? (b) 1,000 envelopes at 25 for  $2\frac{1}{2}d.$ ?
9. Draw an oblong to show an orchard 15 yards wide and 4 times as long as it is broad. Use squared paper. How many steps would a man take in walking all round the orchard, if his step measured 2 feet?
10.  $315d. + 127$  halfpence + 93 threehalfpence - 73 threepences.
11. Eggs are bought at 1s. 3d. a score and sold at 1s. 2d. a dozen. Find the profit on 120 bought and sold.
12. Mother gives the shopman a £1 note to pay for the following:  $\frac{3}{4}$  lb. bacon at 1s. 2d. a lb.;  $1\frac{1}{4}$  lb. butter at 1s. 6d. a lb.; 2 tins of salmon at  $10\frac{1}{2}d.$  a tin;  $\frac{3}{4}$  lb. lard at 8d., and  $\frac{1}{2}$  a gall. of vinegar at 3d. a pint. What change does she get?
13. What do the following stand for: XXIV, IX, XCIII, LXXXVI, and LX?
14. (a) 1,000 threehalfpence - 1,000 pence. (Answer in £ s. d.)
15. (a)  $\frac{1}{2} + \frac{1}{4} + \frac{1}{8}$ ; (b)  $\frac{1}{3} + \frac{1}{2} + \frac{1}{6}$ ; (c)  $1\frac{7}{8} - 1\frac{1}{2}$ ; (d)  $2\frac{3}{4} - 1\frac{1}{2}$ .
16. Find the area of the shaded portion in the diagram.
17. Measure the lines in inches and tenths.



- A     B
- C
- D



## Exercise 42

### Revision

#### ANSWERS

1. (a) 11 yd. 2 ft.; (b) 1 yd. 2 ft.
2. (a) 5 gall. 3 qt. 1 pt.; (b) 5 wk. 4 dy.
3. (a) 4 st. 8 lb.; (b) 3 st. 4 lb.
4. (a) 11 tons 19 cwt.; (b) 3 dy. 8 hr.
5. 24 sq. ft.; 6 yd. 2 ft.
6. (a) 6,383; (b) 4,512; (c) 7,396.
7. (a) 70 (29 R); (b) £12. 2s. 10½d.; (c) £3. 5s. 3d.; 8. (a) 6s. 8d.; (b) 8s. 4d.
9. 225 steps. 10. £1. 4s. 11d. 11. 4s. 2d. 12. 14s.
13. 24, 9, 93, 86, 60. 14. £2. 1s. 8d. 15. (a)  $\frac{7}{8}$ ; (b) 1; (c)  $\frac{3}{8}$ ; (d)  $1\frac{1}{4}$ .
16. 69 sq. in. 17. A,  $1\frac{1}{10}$  in.; B,  $1\frac{3}{10}$  in.; C,  $2\frac{7}{10}$  in.; D,  $3\frac{3}{10}$  in.

#### WORKING FORM OF A PROBLEM

No. 11 pupil's page: Profit =  $\frac{120}{12}$  at 1s. 2d. —  $\frac{120}{20}$  at 1s. 3d.  
= 10 at 1s. 2d. — 6 at 1s. 3d.

#### MISCELLANEOUS ORAL EXERCISES

1. How many hours in  $\frac{3}{4}$  of a day? (18.)
2. 3 tons of coal at 2s. a cwt. (£6.)
3. 12s. 6d. — 7s. 9½d. (4s. 8½d.)
4. Find (a)  $\frac{1}{4}$ ; (b)  $\frac{2}{3}$ ; (c)  $\frac{1}{2}$ ; (d)  $\frac{1}{12}$ ; (e)  $\frac{1}{8}$  of 3 inches. ((a)  $\frac{3}{4}$  in.; (b) 2 in.; (c)  $1\frac{1}{2}$  in.; (d)  $\frac{1}{4}$  in.; (e)  $\frac{1}{2}$  in.)
5. A motor travels at the rate of 34 m.p.h. How far will it travel in  $1\frac{1}{2}$  hr.? (51 miles.)
6. 10 yards at 3s. 4d. a yd. (£1. 13s. 4d.)
7. A girl bought 2 dolls. One cost 2s. 6d. and the other 6d. more. What did she pay for the 2 dolls? (5s. 6d.)
8. A length of 2 ft. 6 in. is represented by a line drawn on a scale of 1 inch to 1 foot. How long is the line? ( $2\frac{1}{2}$  in.)
9. (a)  $1\frac{1}{2} + 1\frac{3}{10}$  ( $2\frac{1}{2}$ ); (b)  $1\frac{2}{3} + 1\frac{5}{6}$  ( $3\frac{1}{2}$ ); (c)  $1\frac{3}{4} + \frac{3}{8}$  ( $2\frac{1}{8}$ ).
10. 24 oranges at 11d. a dozen. (1s. 10d.)
11. How many inch-nails can be cut from a length of wire 1 yd. 1 ft. 1 in. long. (49.)
12. 6 articles at 1s. 5½d. each. (8s. 9d.)
13. A milkman has 2 gall. 2 qt. of milk in a can. How many customers can each receive 1 pt.? (20.)
14. How many  $\frac{1}{2}$ d. stamps can be bought for 1s. 7½d.? (39.)

## Exercise 43

### Mental Arithmetic

Write answers only.

1. How many farthings in  $5\frac{1}{2}d.$ ;  $7\frac{1}{4}d.$ ;  $9\frac{1}{2}d.$ ;  $11\frac{3}{4}d.$ ;  $1s. 1\frac{1}{2}d.$ ;  $1s. 6\frac{1}{4}d.$ ;  $1s. 9\frac{3}{4}d.$ ?
2. How many pence in  $4s. 2d.$ ;  $5s. 9d.$ ;  $7s. 11d.$ ;  $9s. 3d.$ ;  $12s. 6d.$ ;  $13s. 9d.$ ;  $15s. 11d.$ ?
3. (a) 2 dozen at  $1\frac{1}{2}d.$  each; (b) 9 at  $7\frac{1}{2}d.$  each; (c) 54 at  $1s. 2d.$  a dozen.
4. (a) 5 at  $11\frac{1}{2}d.$  each; (b)  $1\frac{1}{2}$  lb. at  $1s. 5d.$  a lb.; (c) 3 pints at  $7d.$  a qt.
5. (a)  $13 + 27 + 19$ ; (b)  $153 \times 6$ ; (c)  $1,000 - 496$ ; (d)  $431 \div 7$ .
6. (a)  $7\frac{1}{2}d. + 9\frac{1}{2}d. + 11\frac{3}{4}d.$ ; (b)  $3s. 2\frac{1}{2}d. \times 5$ ; (c)  $13s. 9d. - 7s. 6\frac{1}{2}d.$ ; (d)  $\frac{1}{8}$  of  $13s. 4d.$
7. Change: (a)  $4\frac{1}{4}$  lb. to oz.; (b) 1 yd. 2 ft. to in.; (c)  $1\frac{3}{4}$  hr. to min.; (d) 1 day 13 hr. to hr.
8. (a)  $\frac{8}{10} = ?$ ; (b)  $\frac{7}{6} = ?$ ; (c)  $\frac{9}{12} = ?$ ; (d)  $\frac{10}{3} = ?$ ; (e)  $\frac{8}{12} = ?$ ; (f)  $\frac{2}{5} = ?$ .
9. (a)  $\frac{1}{2} + \frac{1}{3} = ?$ ; (b)  $\frac{1}{3} + \frac{1}{4} = ?$ ; (c)  $\frac{1}{2} + \frac{1}{4} = ?$ ; (d)  $\frac{7}{8} - \frac{1}{2} = ?$ ; (e)  $\frac{5}{6} - \frac{2}{3} = ?$ ; (f)  $\frac{4}{5} - \frac{3}{10} = ?$ .
10. How many tens in (a) 30; (b) 16 hundred; (c) five thousand?
11. (a)  $\frac{1}{2}$  of  $7s. 10d.$ ; (b)  $\frac{2}{3}$  of  $\pounds 1$ ; (c)  $\frac{7}{8}$  of  $11s.$ ; (d)  $\frac{5}{6}$  of 1 day; (e)  $\frac{3}{4}$  of  $15s.$
12. (a)  $1\frac{1}{2}$  lb. + 9 oz.; (b)  $1\frac{3}{4}$  hr. + 45 min.; (c) 1 ton 19 cwt. + 1 ton 7 cwt.; (d) 1 gall. 3 qt + 1 gall. 2 qt.
13. (a) 1 yd. 2 ft. + 2 yd. 2 ft.; (b) 3 ft. 11 in. + 2 ft. 10 in.; (c) 3 wk. 5 dy. + 1 wk 3 dy.
14. What part of 1 ton is (a) 15 cwt.; (b) 10 cwt.; (c) 8 cwt.; (d) 5 cwt.?
15. How much is needed in each case to make  $\pounds 1$ : (a)  $12s. 6d.$ ; (b)  $9s. 11\frac{1}{2}d.$ ; (c)  $3s. 7\frac{1}{2}d.$ ; (d)  $17s. 1\frac{1}{4}d.$ ?
16. (a)  $1\frac{1}{2}$  lb. of chocolate at  $6d.$  a  $\frac{1}{4}$  lb.; (b)  $7s. 4d.$  is paid for 8 hr. work. How much per hr. is that?
17. How many hr. and min. are there from (a) 8.55 a.m. to 10.15 a.m.? (b) 10.10 a.m. to 11.35 a.m.?
18. A halfpenny measures 1 inch across. Find the value of a line of half-pennies, 2 yd. long?
19. A grass plot is 15 yd. 2 ft. long and 9 yd. 1 ft. wide. Find the distance round it.
20. The distance between two lines on an exercise book is  $\frac{1}{4}$  in. What is the distance between the 1st line and the 27th line?
21. An exercise book is 9 in. long and  $7\frac{1}{2}$  in. wide. Find the distance round it in ft. and in.
22. How many 3-pint bottles can be filled from a cask holding 6 gall.?
23. 7 dusters at  $3\frac{1}{2}d.$  each. Change from  $10s. = ?$
24. (a) 3 times  $1s. 6d.$  — twice  $1s. 7d.$ ; (b)  $\frac{2}{3}$  of 1 guinea —  $\frac{3}{4}$  of  $10s. 4d.$
25. How many penholders at 3 a penny can be bought for  $5s. 11d.$ ?

## Exercise 43

### Mental Arithmetic

#### ANSWERS

1. 22, 29, 38, 47, 54, 73, 87.
2. 50, 69, 95, 111, 150, 165, 191.
3. (a) 3s.; (b) 5s.  $7\frac{1}{2}d.$ ; (c) 5s. 3d.
4. (a) 4s.  $9\frac{1}{2}d.$ ; (b) 2s.  $1\frac{1}{2}d.$ ; (c)  $10\frac{1}{2}d.$
5. (a) 59; (b) 918; (c) 504; (d) 61 (4 R).
6. (a) 2s.  $4\frac{3}{4}d.$ ; (b) 16s.  $0\frac{1}{2}d.$ ; (c) 6s.  $2\frac{1}{2}d.$ ; (d) 1s. 8d.
7. (a) 68 oz.; (b) 60 in.; (c) 105 min.; (d) 37 hr.
8. (a)  $\frac{4}{5}$ ; (b)  $1\frac{1}{8}$ ; (c)  $\frac{3}{4}$ ; (d)  $3\frac{1}{3}$ ; (e)  $\frac{2}{3}$ ; (f)  $1\frac{4}{5}$ .
9. (a)  $\frac{5}{8}$ ; (b)  $\frac{1}{12}$ ; (c)  $\frac{3}{4}$ ; (d)  $\frac{3}{8}$ ; (e)  $\frac{1}{8}$ ; (f)  $\frac{1}{2}$ .
10. (a) 3; (b) 160; (c) 500.
11. (a) 3s. 11d.; (b) 13s. 4d.; (c) 9s.  $7\frac{1}{2}d.$ ; (d) 20 hr.; (e) 11s. 3d.
12. (a) 2 lb. 1 oz.; (b)  $2\frac{1}{2}$  hr.; (c) 3 tons 6 cwt.; (d) 3 gall. 1 qt.
13. (a) 4 yd. 1 ft.; (b) 6 ft. 9 in.; (c) 5 wk. 1 dy.
14. (a)  $\frac{3}{4}$ ; (b)  $\frac{1}{2}$ ; (c)  $\frac{2}{3}$ ; (d)  $\frac{1}{4}$ .
15. (a) 7s. 6d.; (b) 10s.  $0\frac{1}{2}d.$ ; (c) 16s.  $4\frac{1}{2}d.$ ; (d) 2s.  $10\frac{3}{4}d.$
16. (a) 3s.; (b) 11d.
17. (a) 1 hr. 20 min.; (b) 1 hr. 25 min.
18. 3s.
19. 50 yd.
20.  $6\frac{1}{2}$  in.
21. 2 ft. 9 in.
22. 16.
23. 7s.  $11\frac{1}{2}d.$
24. (a) 1s. 4d.; (b) 6s. 3d.
25. 213.

#### MENTAL ARITHMETIC

Purpose of mental work in arithmetic. See page 513, *Handbook of Suggestions for Teachers* (1937).

#### MISCELLANEOUS ORAL WORK

1. Find the cost of 2 tons 10 cwt. at 2s. per cwt. (£5.)
2. May's doll cost 12s. 6d. and Jane's 2s. 6d. less. What was the cost of both dolls together? (£1. 2s. 6d.)
3. 66 oranges at 6d. a dozen. (2s. 9d.)
4.  $\pounds\frac{1}{8} + \pounds\frac{1}{8}$ . (5s. 10d.)
5. A bus travelled 132 miles in 11 hr. How many miles per hour is that? (12.)
6. 3 yd. — 39 in. (Ans. in yd., ft., in.). (1 yd. 2 ft. 9 in.)
7. How many 2-oz. packets can be made from 5 lb.? (40.)
8. 3 pennies weigh an oz. What will 120 pennies weigh? (2 lb. 8 oz.)
9. The area of an oblong is 108 sq. in. The length is 12 in. Find the width. (9 in.)
10. 10 yd. at 1d. per inch. (£1. 10s.)
11. 12 gall. at  $3\frac{1}{2}d.$  a pint. (£1. 8s.)
12. 9 lb. at  $3\frac{1}{2}d.$  a lb. (2s.  $7\frac{1}{2}d.$ )

## Exercise 44

### Area and Scale. Practical Work

1. Using squared paper, draw a rectangle 9 ft. by 4 ft. Let 1 side of a small square stand for 1 foot. What is the area of the rectangle (a) in square feet; (b) in square yards? Draw lines showing the number of sq. yd. there are in the rectangle.
2. Using squared paper, draw a rectangle 1 ft. 4 in. by 1 ft. 3 in. Let 1 side of a small square stand for 1 inch. This rectangle has an area of 240 sq. in. ( $16 \times 15$  sq. in.) or 1 sq. ft. 96 sq. in. Test the area by making out the square foot as shown in fig. 1 and counting the squares in the remainder.
3. Find (a) in the usual way; (b) by making a drawing on squared paper, the area of a rectangle 1 ft. 6 in. by 1 ft. 2 in.
4. Find (a) by arithmetic; (b) by making a drawing on squared paper, the area of the floor (fig. 2) shown. Give your answer (a) in sq. ft.; (b) in sq. yd. and sq. ft.

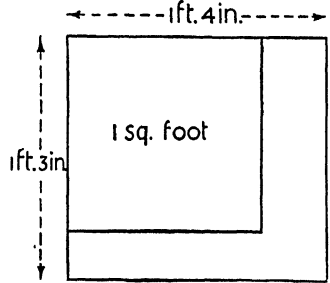


Fig. 1

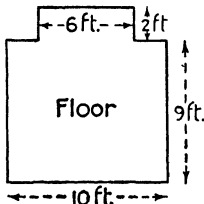


Fig. 2

5. Find (a) by arithmetic; (b) by making a drawing on squared paper, the area of the floor (fig. 3) shown. Give your answer (a) in sq. ft.; (b) in sq. yd. and sq. ft.

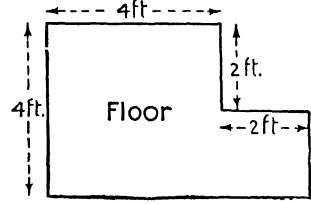
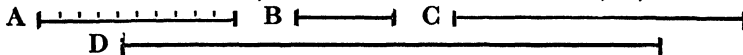


Fig. 3

6. How far is it all round the floor (a) fig. 1; (b) fig. 2?
7. If line A stands for 1 mile, what distances do lines B, C, and D stand for?



8. Letting  $\frac{1}{2}$  an inch stand for 1 foot, draw lines to stand for (a) 3 ft. 6 in.; (b) 4 ft.; (c) 2 ft. 9 in.
9. Fig. 4 shows a map of a railway, drawn to the scale of  $\frac{1}{10}$  inch = 1 mile. How far is it from (a) A to B; (b) A to C; (c) A to D in a straight line; (d) B to C?

10. How long is (a) the shortest distance; (b) the longest distance on the railway?

11. A man travels from C through A, F, E, and D and back to C. How far has he travelled?

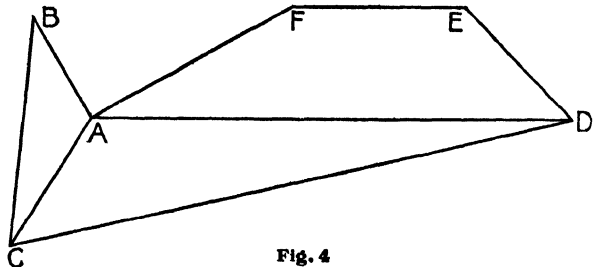


Fig. 4

## Exercise 44

### Area and Scale

#### ANSWERS

1. (a) 36 sq. ft.; (b) 4 sq. yd.
2. —
3. 1 sq. ft. 108 sq. in.
4. (a) 102 sq. ft.; (b) 11 sq. yd. 3 sq. ft.
5. (a) 20 sq. ft.; (b) 2 sq. yd. 2 sq. ft.
6. (a) 14 yd.; (b) 6 yd. 2 ft.
7. B,  $\frac{1}{2}$  ml.; C,  $1\frac{1}{2}$  ml.; D,  $2\frac{3}{4}$  ml.
8. —
9. (a) 6 ml.; (b) 8 ml.; (c) 25 ml.; (d) 12 ml.
10. (a) 6 ml.; (b) 30 ml.
11. 67 ml.

#### AREA

Revision Work. See page 18a.

#### TABLE WORK

144 square inches = 1 sq. ft.; 9 sq. ft. = 1 sq. yd.

1. How many sq. in. in (a)  $1\frac{1}{2}$  sq. ft.; (b) 2 sq. ft.; (c)  $2\frac{1}{4}$  sq. ft.; (d)  $2\frac{1}{2}$  sq. ft.; (e)  $3\frac{1}{2}$  sq. ft.? (216, 288, 324, 360, 504 sq. in.)
2. How many sq. ft. in (a) 2 sq. yd.; (b) 5 sq. yd.; (c) 2 sq. yd. 3 sq. ft.; (d) 3 sq. yd. 7 sq. ft.? (18, 45, 21, 34 sq. ft.)
3. Change to sq. ft. and sq. in.: 150 sq. in. (1 sq. ft. 6 sq. in.); 200 sq. in. (1 sq. ft. 56 sq. in.); 300 sq. in. (2 sq. ft. 12 sq. in.).
4. Change to sq. yd. and sq. ft.: 12 sq. ft. (1 sq. yd. 3 sq. ft.); 16 sq. ft. (1 sq. yd. 7 sq. ft.); 30 sq. ft. (3 sq. yd. 3 sq. ft.).

#### ORAL EXERCISES

1. Find the area of a rectangle  $3\frac{1}{2}$  in. by 3 in. ( $10\frac{1}{2}$  sq. in.); 3 ft. by  $1\frac{1}{2}$  ft. ( $4\frac{1}{2}$  ft.); 3 yd.  $\times$   $2\frac{1}{2}$  yd. ( $7\frac{1}{2}$  sq. yd.).
2. Find the area of a rectangle 1 ft. 3 in. by 10 in. (150 sq. in. = 1 sq. ft. 6 sq. in.); 1 ft. 2 in. by 1 ft. 1 in. (1 sq. ft. 38 sq. in.).  
(Note: At this stage, change the units to *inches*.)
3. The area of a rectangle is 12 sq. ft. It is 4 ft. long. How wide is it? (3 ft.)
4. A carpet is 4 yd. by 3 yd. What must one pay for it at 6s. 6d. a sq. yd. (£3. 18s.)

#### SCALE WORK

1. If  $\frac{1}{2}$  inch stands for 8d., what length will stand for 2s.? ( $1\frac{1}{2}$  in.); 2s. 8d.? (2 in.); 4s. 8d.? ( $3\frac{1}{2}$  in.).
2. If  $\frac{1}{8}$  inch stands for 1 pint, what length will stand for 1 qt.? ( $\frac{1}{4}$  in.); 1 gall.? (1 in.); 2 gall. 2 qt.? ( $2\frac{1}{2}$  in.).
3. A postcard is 5 in. by 4 in. If this is cut out half size, what is the area of the cut out? (5 sq. in.)
4. If 1 inch stands for 1 ft., what length will stand for the height of a boy 4 ft. 3 in.? ( $4\frac{1}{4}$  in.)
5. On a map 1 inch stands for 36 miles. Find the real distance between 2 towns when the map distance is  $1\frac{3}{8}$  in. (60 miles.)
6. On a map 1 inch stands for 100 miles. The distance between A and B on the map is  $2\frac{1}{16}$  inches. What is the real distance? (210 miles.)

## Exercise 45

### A. Measuring Division. B. Mental Arithmetic

#### A

1. How many times can a length of 3 inches be cut from a length of 4 ft.?
2. How many 2-quart bottles can be filled from a cask holding  $6\frac{1}{2}$  gall.?
3. How many articles at 1s. 6d. each can be purchased for 3 guineas?
4. How many lengths each 1 ft. 3 in. can be cut from a roll of 10 yards?
5. How many books at 1s. 9d. each can be bought for £3. 6s. 6d.?
6. How many 3-oz. butter pats can be made from  $12\frac{3}{4}$  lb. of butter?
7. How many balls at  $6\frac{1}{2}d.$  each can be bought for 11s. 11d.?
8. Sweets are packed in bottles holding  $4\frac{1}{2}$  lb. How many bottles will be required for 117 lb. of sweets?
9. How many articles at 4s. 6d. each can be bought for £4. 19s.?
10. How many times can a bucket holding  $4\frac{1}{2}$  gall. of water be filled from a bath holding 99 gall.?
11. Paraffin oil is sold at  $11\frac{1}{2}d.$  a gallon. How many gall. can be bought for £1. 10s. 8d.?
12. Mother paid 1s. 4d. a lb. for her joint of meat. How many lbs. did she get if her bill came to 7s. 4d.?
13. A bus leaves the station every 20 minutes. How many buses leave the station from 9 a.m. to 4 p.m.?

#### B

Write answers only.

14. On her 9th birthday Mary received 6d. for every month she had lived. How much did she receive?
15. How many  $1\frac{1}{2}d.$  stamps can be bought for 2s.  $7\frac{1}{2}d.$ ?
16. After spending  $\frac{3}{4}$  of her money, Mother had 12s. 6d. left. How much had she at first?
17. How much is required to make each amount into £1: (a) 13s. 6d.; (b) 17s.  $5\frac{1}{2}d.$ ; (c) 18s.  $3\frac{3}{4}d.$ ?
18. (a)  $2\frac{1}{3} + 3\frac{1}{6}$ ; (b)  $1\frac{7}{8} - 1\frac{1}{2}$ ; (c)  $3\frac{1}{5} + 1\frac{7}{10}$ ; (d)  $1\frac{3}{4} - \frac{3}{8}$ .
19. A 12-inch ruler broke into two parts. One part was  $7\frac{3}{4}$  in. How long was the other part?
20. How many bulbs at  $2\frac{1}{2}d.$  can be bought for 2s. 6d.?
21. The distance round a square piece of paper is 1 foot. Find the area of the paper.
22. It is now 1.15 p.m. What time will it be in 70 minutes?

## Exercise 45

### A. Measuring Division.    B. Mental Arithmetic

#### ANSWERS

##### A

- |        |        |        |         |         |                      |
|--------|--------|--------|---------|---------|----------------------|
| 1. 16. | 2. 13. | 3. 42. | 4. 24.  | 5. 38.  | 6. 68.               |
| 7. 22. | 8. 26. | 9. 22. | 10. 22. | 11. 32. | 12. $5\frac{1}{2}$ . |
|        |        |        |         |         | 13. 21.              |

##### B

14. £2. 14s.    15. 21.    16. £2. 10s.    17. (a) 6s. 6d.; (b) 2s.  $6\frac{1}{2}d.$ ; (c) 1s.  $8\frac{1}{4}d.$   
 18. (a)  $5\frac{1}{2}$ ; (b)  $\frac{3}{8}$ ; (c)  $4\frac{9}{10}$ ; (d)  $1\frac{3}{8}$ .    19.  $4\frac{1}{4}$  in.    20. 12.    21. 9 sq. in.  
 22. 2.25 p.m.

### MEASURING DIVISION

#### *Practical Work.*

1. Draw a line 12 in. long. How many  $1\frac{1}{2}$  in. are there in this line? (8); etc.
2. Use the demonstration clock to find how many 20 minutes there are in 1 hour.
3. Show, by a drawing, how many times a length of 2 in. can be cut from a length of  $1\frac{1}{2}$  ft.

#### *Blackboard Work.*

*Example:* How many balls at  $7\frac{1}{2}d.$  each can be bought for 6s.  $10\frac{1}{2}d.$ ?

$$\text{No. of balls} = \frac{6s. \ 10\frac{1}{2}d.}{7\frac{1}{2}d.}$$

Step 1. Express in fraction form.

$$= \frac{55 \text{ (threehalfpences)}}{5 \text{ (threehalfpences)}}$$

Step 2. Change to the same denomination.

$$= 11.$$

Step 3. Divide.

(Note: (1) In a measuring division sum, the answer is a number of times.

(2) Keep to the highest possible denomination when reducing. In the example, threehalfpence have been chosen in preference to halfpence.)

### MISCELLANEOUS ORAL EXAMPLES

1. A hoop is 1 ft. 8 in. in circumference. How many turns will it make in travelling 1 yd. 4 in.? (2.)
2. How many balls at 9d. each can be bought for 6s.? (8.)
3. How many 1s. 3d. books for 10s.? (8.)
4. A cyclist travels 1 mile in  $7\frac{1}{2}$  min. How far will he go in 30 min.? (4 miles.)

(45a) 20447

## Exercise 46

### A. Bills. B. Drawing and Measurement

#### A

- |   |  |
|---|--|
| <p>1. 10 lb. of paint at 1s. 1½d. a lb. =</p> <p>4 rolls of paper at 2s. 3½d. a roll =</p> <p>3 pt. of varnish at 22s. per gall. =</p> <p>Man's time, 12 hr. at 1s. 7½d. an hr. =</p> <p style="text-align: right;">Total =</p> | <p>2. 1¼ tons of coal at 2s. per cwt. =</p> <p>1 gross bundles of firewood at 11½d. per dozen bundles =</p> <p>¼ ton of coke at 1s. 8d. per cwt. =</p> <p style="text-align: right;">Total =</p>   |
| <p>3. ½ dozen knives at 18s. 9d. a dozen =</p> <p>½ dozen forks at 12s. 3d. a dozen =</p> <p>1 dozen spoons at 8½d. each =</p> <p>½ dozen spoons at 10½d. each =</p> <p style="text-align: right;">Total =</p>                  | <p>4. 5 dozen bananas at 10 for 1s. =</p> <p>12½ lb. of apples at 5 lb. for 1s. =</p> <p>16 lemons at 4 for 3d. =</p> <p>7 peaches at 4½d. each =</p> <p style="text-align: right;">Total =</p>  |
| <p>5. 3½ yards at 2s. 11d. a yard =</p> <p>12 yd. at 11¾d. a yard =</p> <p>5½ yd. at 1s. 7d. a yard =</p> <p>1 dozen yards at 2s. 3d. a yard =</p> <p style="text-align: right;">Total =</p>                                    | <p>6. 1 dozen jerseys at 3s. 3d. each =</p> <p>11 pairs of knickers at 1s. 11½d. a pair =</p> <p>11 pairs of stockings at 1s. 5½d. a pair =</p> <p>11 pairs of football boots at 8s. 11d. a pair =</p> <p style="text-align: right;">Total =</p> |

#### B

1. Draw to a scale of 1 inch = 1 foot, lines to stand for (a) 1½ feet; (b) 3¾ ft.; (c) 2 ft. 3 in.
2. Using squared paper (the side of one small square to a yard) draw the plan of a rectangular yard, 35 yards by 40 yards. Show a path 3 yd. wide outside the garden. Say how you would find the area of the path.
3. Draw a line 4½ inches long. Mark off ⅔ of the line.
4. Draw 5 parallel lines at a distance of 2 inches from one another. What is the distance between the 1st and 5th lines?
5. Letting ½ an inch stand for 1 oz., draw lines to stand for (a) ½ lb.; (b) ¾ lb.; (c) 1 lb. 3 oz.
6. A plot of land forms a right-angled triangle. The sides forming the right angle are 28 yd. and 21 yd. long. Draw the plot to a scale of ⅓ of an inch to 1 yard and find, by measuring, the length of the third side.
7. Line AB stands for 36 miles. How many miles is that to the inch?

A \_\_\_\_\_ B



## Exercise 46

### A. Bills. B. Drawing and Measurements

#### ANSWERS

##### A

1. £2. 8s. 2d.    2. £3. 9s. 10d.    3. £1. 9s. 3d.    4. 12s. 1½d.    5. £2. 17s. 8d.  
6. £8. 14s. 8d.

##### B

1. Lines: (a) 1½ in.; (b) 3¾ in.; (c) 2¼ in.    2. —.    3. —.    4. 8 in.  
5. Lines: (a) 4 in.; (b) 6 in.; (c) 9½ in.    6. —.    7. 12 mile to 1 inch.

#### SHOPPING EXERCISES

1. 6 watering-cans at 3s. 9d. each. (£1. 2s. 6d.)
2. 5½ yd. of stair carpet at 6s. 8d. a yd. (£1. 16s. 8d.)
3. 8 yd. of curtain material at 1s. 11d. a yd. (15s. 4d.)
4. 5 lb. of cod fish at 10½d. a lb. (4s. 4½d.)
5. 2 motor tyres at 32s. 6d. each. (£3. 5s.)
6. 8½ lb. of lamb at 1s. 8d. a lb. (14s. 2d.)
7. ½ stone of rice at 3½d. a lb. (2s. 0½d.)
8. 1 gall. of oil at 1s. 10d. a qt. (7s. 4d.)
9. Two hot-water bottles at 3s. 11½d. each. (7s. 11d.)
10. 1,000 envelopes at 25 for 2d. (6s. 8d.)
11. 3 gross of pen-holders at 1d. each. (£1. 16s.)
12. 2 stones of potatoes at 7 lb. for 4d. (1s. 4d.)
13. 2 lb. 13 oz. at 1s. 4d. a lb. (3s. 9d.)
14. 3½ dozen at 2½d. each. (8s. 9d.)
15. 3 pints of milk per day for 6 days at 7d. a quart. (5s. 3d.)
16. 3 dozen eggs at 4 for 7½d. (5s. 7½d.)
17. 2 qt. of varnish at 18s. a gall. (9s.)
18. 120 articles at 2s. 6d. each. (£15.)
19. 3 gross of pencils at 8d. a dozen. (£1. 4s.)
20. How much would be saved by buying a ton of coal for £1. 17s. 6d. rather than 20 cwt. at 2s. a cwt.? (2s. 6d.)

## Exercise 47

### A. Mental. B. Mechanical

#### A

1. How many rubbers at 2 for  $1\frac{1}{2}d.$  can be bought for  $10\frac{1}{2}d.$ ?
2. Father planted 5 rows of plants, 18 in a row and had 4 left over. How many plants had he at first?
3. How many pieces of 6 inches can be cut from a length of  $11\frac{1}{2} yd.$ ?
4. Divide 720 by 12 and add 100 to your answer.
5. 3 lb. 2 oz. at  $8d.$  a lb.
6. How many (a) halfpence in  $1s. 7\frac{1}{2}d.$ ; (b) half-crowns in  $\pounds 1. 5s.$ ; (c) farthings in  $1s. 7\frac{1}{4}d.$ ?
7. (a) 3 lb. 2 oz. — 12 oz.; (b) 1 week 1 day — 6 days; (c) 1 hr. 15 min. —  $\frac{3}{4}$  hr.
8. Find the cost of 500 postcards at 10 for  $1\frac{1}{2}d.$
9. Find the change from  $\pounds 1$  after paying for 3 gall. of milk at  $3\frac{1}{2}d.$  a pint.
10. (a)  $\frac{2}{3}$  of  $7s. 1\frac{1}{2}d.$ ; (b)  $\frac{3}{4}$  of 1 hr. 20 min.; (c)  $\frac{5}{6}$  of  $\pounds 1$ .

#### B

- |  |   |
|--|---|
| <ol style="list-style-type: none"> <li>1. <math>\frac{1}{7}</math> of 6,713.</li> <li>3. <math>127 \times (a) 19</math>; (b) 23; (c) 37.</li> <li>5. <math>7,619 - (1,201 + 2,308)</math>.</li> <li>7. <math>3,327 \div (a) 19</math>; (b) 37.</li> <li>9. <math>\frac{4}{5}</math> of 7,314.</li> <li>11. <math>1,213 + 3,756 + 179 + 33</math>.</li> <li>13. <math>\pounds 2\frac{1}{3} + \pounds 3\frac{1}{8} + \pounds 1\frac{7}{12} - \pounds 2\frac{2}{3}</math>.</li> <li>15. <math>(99 \times 57) - 1,009</math>.</li> <li>17. Change to threepences, <math>\pounds 3. 9s</math>.</li> <li>19. 3 lb. 2 oz. + 4 lb. 17 oz. — 2 lb. 9 oz.</li> <li>21. (a) <math>1\frac{5}{8} - \frac{3}{4}</math>; (b) <math>2\frac{2}{3} + 1\frac{5}{8}</math>.</li> <li>23. 1 hr. 37 min. + 2 hr. 33 min. — 1 hr. 40 min.</li> <li>25. (a) <math>135 &lt; 29</math>; (b) <math>3,719 \div 45</math>.</li> <li>27. <math>1s. 7\frac{1}{2}d. \times (a) 15</math>; (b) 19; (c) 27.</li> </ol> | <ol style="list-style-type: none"> <li>2. <math>\frac{1}{5}</math> of <math>\pounds 3. 15s. 7\frac{1}{2}d.</math></li> <li>4. <math>1s. 9\frac{1}{2}d. \times (a) 21</math>; (b) 16; (c) 27.</li> <li>6. <math>\pounds 79. 13s. 4\frac{3}{4}d. - \pounds 57. 14s. 9\frac{1}{2}d.</math></li> <li>8. <math>\pounds 13. 15s. 3d. \div (a) 12</math>; (b) 6.</li> <li>10. <math>\frac{7}{8}</math> of <math>\pounds 92. 4s. 8d.</math></li> <li>12. <math>\pounds 11. 17s. 0d. + \pounds 13. 5s. 9d. + 17s. 8\frac{1}{2}d. + 1s. 11d.</math></li> <li>14. <math>5\frac{1}{4} ft. + 3\frac{3}{4} ft. + 2\frac{7}{12} ft. - 1\frac{5}{6} ft.</math><br/>(Ans. in yd., ft., and in.)</li> <li>16. <math>(1s. 8\frac{1}{2}d. \times 17) - 3s. 11\frac{3}{4}d.</math></li> <li>18. Change to threehalfpence, <math>11s. 10\frac{1}{2}d.</math></li> <li>20. 2 yd. 1 ft. 6 in. — 1 yd. 2 ft. 9 in.</li> <li>22. Arrange in order, lowest first:<br/><math>\frac{3}{4}, \frac{5}{8}, \frac{2}{3}</math>.</li> <li>24. 3 gall. 2 qt. + 4 gall. 2 qt. — 3 qt. 1 pt.</li> <li>26. (a) <math>\pounds 1. 13s. 9d. \times 12</math>; (b) <math>1s. 8d. \times 37</math>.</li> <li>28. <math>1s. 4\frac{1}{4}d. \times (a) 19</math>; (b) 23; (c) 36.</li> </ol> |
|--|---|

## Exercise 47

### A. Mental. B. Mechanical

#### ANSWERS

##### A

1. 14.      2. 94.      3. 69.      4. 160.      5. 2s. 1d.      6. (a) 39; (b) 10; (c) 77.  
 7. (a) 2 lb. 6 oz.; (b) 2 dy.; (c)  $\frac{1}{2}$  hr.      8. 6s. 3d.      9. 13s.      10. (a) 4s. 9d.;  
           (b) 1 hr.; (c) 16s. 8d.

##### B

1. 959.      2. 15s.  $1\frac{1}{2}d.$       3. (a) 2,413; (b) 2,921; (c) 4,699.      4. (a) £1. 17s.  $7\frac{1}{2}d.$ ;  
           (b) £1. 8s. 8d.; (c) £2. 8s.  $4\frac{1}{2}d.$       5. 4,110.      6. £21. 18s.  $7\frac{1}{4}d.$   
 7. (a) 175 (2 R); (b) 89 (34 R).      8. (a) £1. 2s.  $11\frac{1}{4}d.$ ; (b) £2. 5s.  $10\frac{1}{2}d.$       9. 4,876.  
 10. £80. 14s. 1d.      11. 5,181.      12. £26. 2s.  $4\frac{1}{2}d.$       13. £4. 4s. 10d.  
 14. 3 yd. 0 ft. 9 in.      15. 4,634.      16. £1. 5s.  $0\frac{3}{4}d.$       17. 276.      18. 95.  
 19. 5 lb. 10 oz.      20. 1 ft. 9 in.      21. (a)  $1\frac{1}{12}$ ; (b)  $4\frac{1}{2}$ .      22.  $\frac{2}{3}$ ,  $\frac{3}{4}$ ,  $\frac{5}{8}$ .  
 23. 2 hr. 30 min.      24. 7 gall. 0 qt. 1 pt.      25. (a) 3,915; (b) 82 (29 R).  
 26. (a) £20. 5s.; (b) £3. 1s. 8d.      27. (a) £1. 4s.  $1\frac{1}{2}d.$ ; (b) £1. 10s.  $10\frac{1}{2}d.$ ;  
           (c) £2. 3s.  $10\frac{1}{2}d.$       28. (a) £1. 5s.  $8\frac{3}{4}d.$ ; (b) £1. 11s.  $1\frac{3}{4}d.$ ; (c) £2. 8s. 9d.

#### MISCELLANEOUS ORAL EXAMPLES

1.  $2\frac{1}{2}$  times £3. (£7. 10s.)
2. A piano was bought for £62 and sold at a loss of £9. 10s. Find the selling price. (£52. 10s.)
3. Share 10s. 1d. equally among 10 girls and 1 boy. (11d.)
4. 2 chairs cost 1 guinea. One costs 3s. more than the other. How much did each cost? (12s. and 9s.)
5. A girl wrote £2. 3s. for £3. 2s. How much was she wrong? (19s.)
6. 30s. is charged for a load of coal and 3s. 6d. for carting. How much would 3 such loads cost? (£5. 0s. 6d.)
7.  $\frac{1}{3}$  of 10s. +  $\frac{1}{4}$  of £1. (8s. 4d.)
8. 480 balls at 6d. each. (£12.)
9. How many threepences in 2 florins + 2 half-crowns? (36.)
10. 240 at  $1\frac{1}{2}d.$  each. (£1. 10s.)
11. How many articles at (a) a florin each; (b) a half-crown each, for £1. 10s.? ((a) 15; (b) 12.)
12. 120 at 8d. a dozen. (6s. 8d.)
13. 500 halfpenny stamps. (£1. 0s. 10d.)
14. 4 dozen boxes of matches at  $9\frac{1}{2}d.$  a dozen boxes. (3s. 2d.)
15. Out of 120 eggs, 24 are bad. The remainder are sold at 1s. 3d. a dozen. What was their value? (10s.)

## Exercise 48

### Problems

1. A dealer buys bicycles at £3. 12s. 6d. each and sells them at 5 guineas each. How much does he gain on 12 bought and sold?
2. A milkman has 63 gall. of milk in his cart. What quantity will he have left after serving 84 customers with a quart each and 87 more with 3 pints each?
3. A girl said the sum of £11. 13s. 6d., £22. 19s. 7d., and  $13\frac{1}{2}$  guineas was £52. 17s. 6d. How much was she wrong?
4. One assistant in a shop took £45. 13s. 4d. Another took £17. 14s. 9d. less than that amount. How much did they take together?
5. A dealer bought 3 dozen suits, paid for them with six £10 notes, and received £1. 1s. change. What was the cost of 1 suit, if they were all of equal value?
6. A newsagent receives 3d. in the shilling for selling penny newspapers. How much will he receive on 2,880 papers sold?
7. How many pencils at 2 for  $1\frac{1}{2}$ d. can be bought for £3. 12s. 6d.?
8. A workman spent  $\frac{1}{6}$  of his time walking to and from a job. On his time sheet he stated that the job had taken 7 hr. 12 min. How much time was spent in actual work?
9. Two chairs and a table cost £2. 5s. The table cost £1. 10s. How much was each chair?
10. A dealer bought 2 chests of tea, each holding 84 lb. He made the tea up into  $\frac{1}{4}$  lb. packets. How many packets were there?
11. A farmer bought a horse for 16 guineas. After keeping it for 9 weeks at a cost of 3s. 6d. a week, he sold it to gain £2. 10s. over the cost of the horse and the food. For how much did he sell it?
12. Mother buys 3 lb. 2 oz. of wool to knit socks for Father. If each pair of socks takes 5 oz., how many pairs can be knitted?
13. It took us 1 hr. 35 min. to get to the seaside, and 37 minutes longer to return. How long did the double journey take?
14. The short side of a rug measures 33 inches and the long side 58 inches. Find, in yd. ft. and in., the distance round the rug.
15. A boy makes a right about turn. Through how many degrees has he turned?

## Exercise 48

### Problems

#### ANSWERS

1. £19. 10s.    2. 9 gall. 1 qt. 1 pt.    3. £4. 0s. 11d. too much.    4. £73. 11s. 11d.  
5. £1. 12s. 9d.    6. £3.    7. 1,160.    8. 6 hr.    9. 7s. 6d.    10. 672.  
11. £20. 17s. 6d.    12. 10 pairs.    13. 3 hr. 47 min.    14. 5 yd. 0 ft. 2 in.  
15. 180°.

#### PROBLEM WORK

See pages 510, 511, 512, *Handbook of Suggestions* (1937)

#### *Working Form of a Problem*

*Ex. 1, pupil's page:* Gain = (£5. 5s. — £3. 12s. 6d.) × 12.

*Ex. 2, pupil's page:* Quantity left = 63 gall. — (84 qt. + (87 × 3) pints).

*Ex. 3, pupil's page:* Error = £52. 17s. 6d. — (£11. 3s. 6d. + £22. 19s. 7d. + £13. 13s.)

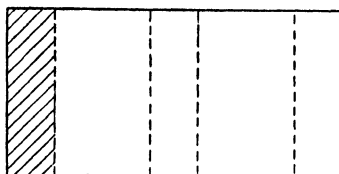
#### MISCELLANEOUS ORAL EXERCISES

1. How many pint mugs can be filled from an urn holding 2 gall. 2 qt. 1 pt.? (21.)
2. How many 1-lb. packets can be made from 48 oz.? (3.)
3. How many inches in 3 ft. 9 in.? (45.)
4. A girl runs twice round a square plot of side 100 yd. How far does she run? (800 yd.)
5. How many hours from midnight, June 1st, to midnight, June 3rd? (48 hr.)
6. A train travels at 42 m.p.h. How far will it travel at this rate between noon and 6 p.m.? (252 ml.)
7. How much short of £1 is 24d. × 9? (2s.)
8. How many lb. in 80 oz.? (5.)
9. 60 bananas are bought at 6 for 5d. and sold at 1d. each. Find the profit. (10d.)
10.  $\frac{1}{2}$  of £3. 3s. (5s. 3d.)
11. A gross case of eggs contained 29 bad ones. How many were sound? (115.)
12. Find the difference in area between one rectangle 9 in. by 8 in. and another 7 in. by 6 in. (30 sq. in.)
13. 12 oz. at 1s. 8d. a lb. (1s. 3d.)

## Exercise 49

### Revision

1. Let 1 inch stand for 1 lb. and draw a line to stand for  $\frac{1}{2}$  a stone (weight).
2. Draw a square, making the sides 4 inches long. Then draw lines joining the middle of the top side with the two base (bottom) angles. What is the area of the biggest triangle within the square?
3. (a)  $\frac{1}{6}$  yd. +  $\frac{2}{3}$  yd.; (b)  $1\frac{5}{8}$  dy. -  $\frac{2}{3}$  dy.; (c)  $\pounds 2\frac{3}{8}$  +  $\pounds 3\frac{3}{4}$ ; (d)  $\frac{3}{5}$  hr. +  $\frac{7}{10}$  hr.
4. Write in another form: (a)  $\frac{11}{3}$ ,  $\frac{19}{8}$ ,  $\frac{13}{4}$ ,  $\frac{17}{6}$ ; (b)  $2\frac{1}{3}$ ,  $1\frac{5}{12}$ ,  $2\frac{1}{4}$ ,  $2\frac{1}{8}$ .
5. Find  $x$  in each of the following: (a)  $\frac{8}{12} = \frac{x}{3}$ ; (b)  $\frac{4}{6} = \frac{x}{3}$ ; (c)  $\frac{6}{8} = \frac{x}{4}$ ; (d)  $\frac{2}{4} = \frac{x}{2}$ .
6. (a)  $\pounds 19. 17s. 4d.$  +  $\pounds 11. 19s. 8d.$  +  $\pounds 7. 6s. 9d.$  +  $\pounds 13. 19s. 8d.$ ; (b)  $\pounds 99. 13s. 4d.$  -  $\pounds 39. 17s. 5d.$
7. Draw a rectangle 6 in. by  $4\frac{1}{2}$  in. Draw a diagonal. What is the area of each triangle?
8. How many school milk bottles ( $\frac{1}{3}$  pint) can be filled from 25 gall. of milk?
9. (a)  $7 \times 10 \times 11 \times 12$ ; (b)  $9,888 \div 200$ ; (c)  $7,169 \div 81$ ; (d)  $97 \times 86$ .
10. Find the sum of two thousand and sixty-seven, three thousand and four, seventy-nine, and one thousand and eighty-four.
11. How many times is 2s. 3d. contained in  $\pounds 13. 10s.$ ?
12. Find the difference between 73 half-crowns and 1,000 sixpences.
13. (a) 3 lb. 6 oz. + 7 lb. 9 oz. + 3 lb. 11 oz.; (b) 9 hr. 12 min. - 3 hr. 45 min.
14. A motor left Lincoln at 8.30 a.m. and arrived Glasgow at 6 p.m. How long did the journey take?
15. How much is  $\pounds 26. 12s. 7\frac{1}{2}d.$  short of  $\pounds 50$ ?
16. Letting  $\frac{1}{2}$  an inch stand for 1 year, draw a line to show how many years old you are.
17. Open out the lid of a match-box, as shown in the diagram. Then measure it and draw one on cardboard, twice the size. Cut it out and fold along the dotted lines. Gum down the flap (shaded part).
18. Make a tray to fit the lid of the match-box in number 17.
19.  $1s. 6\frac{1}{2}d. \times (a) 12$ ; (b)  $\times 34$ .
20. During the week Class III had 235 bottles of milk. How much money should teacher have for the milkman (the bottles are  $\frac{1}{2}d.$  each)?



## Exercise 49

### Revision

#### ANSWERS

1. 1 line, 7 in.    2. 8 sq. in.    3. (a) 2 ft. 6 in.; (b) 1 dy. 4 hr.; (c) £6. 2s. 6d.;  
     (d) 1 hr. 18 min.    4. (a)  $3\frac{2}{3}$ ,  $2\frac{3}{8}$ ,  $3\frac{1}{4}$ ,  $2\frac{5}{8}$ ; (b)  $\frac{7}{3}$ ,  $\frac{17}{12}$ ,  $\frac{9}{4}$ ,  $\frac{17}{8}$ .    5. (a) 2; (b) 2;  
     (c) 3; (d) 1.    6. (a) £53. 3s. 5d.; (b) £59. 15s. 11d.    7.  $13\frac{1}{2}$  sq. in.    8. 600.  
 9. (a) 9,240; (b) 49 (88 R); (c) 88 (41 R); (d) 8,342.    10. 6,234.    11. 120.  
 12. £15. 17s. 6d.    13. (a) 14 lb. 10 oz.; (b) 5 hr. 27 min.    14. 9 hr. 30 min.  
 15. £23. 7s.  $4\frac{1}{2}$ d.    16. —.    17. —.    18. —.    19. (a) 18s. 6d.;  
     (b) £2. 12s. 5d.    20. 9s.  $9\frac{1}{2}$ d.

#### THINGS TO DO

*Length:* (1) Measure (yd., ft., and in.) the height and width of the classroom door after estimating the height. What was your error?

(2) Estimate the length and width of your classroom. Test your estimation. (Ans. to nearest foot.)

(3) What is the area of your classroom floor in (a) square feet; (b) square yards and sq. ft.?

(4) Estimate the length of the hot-water pipe in your classroom. Test. (Nearest ft.)

*Weight:* (1) Weigh a pint of water and then calculate the weight of a gallon.

(2) Weigh out (a)  $\frac{1}{4}$  stone; (b)  $\frac{1}{2}$  stone of potatoes.

(3) Estimate (to the nearest  $\frac{1}{2}$  lb.) the weight of this lump of iron, coal, wood, etc.

(4) Use a spring balance (marked in lb.) to weigh this piece of plasticine. Is it heavier or lighter than you thought it was?

(5) Find your weight (st. and lb.) on the school weighing machine.

*Capacity:* (1) How much water will the tumbler (jar) hold? First estimate; then test.

(2) Test mother's pint jug; quart jug; father's watering-can; etc.

(3) How much water will the measuring jar hold? First estimate; then test.

*Plans:* Draw simple plans (to scale) of a chalk-box; a table-top; the classroom floor; etc.

*Money:* Write down a sum of money, less than £12, having the pence smaller than the pounds. Reverse this sum of money and subtract. Reverse the difference and add.

Try this with three different sums of money.

$$\begin{array}{r}
 \text{£}5 \ 7 \ 3 \\
 \underline{3 \ 7 \ 5} \\
 1 \ 19 \ 10 \\
 \underline{10 \ 19 \ 1} \\
 12 \ 18 \ 11
 \end{array}$$

## Exercise 50

### Tests

#### A

1. (a)  $1,237 + 2,756 + 979 - 1,004$ ; (b)  $137 \times 21$ ; (c)  $2,301 \div 27$ .
2. (a) £93. 2s. 5d. — £37. 11s. 9d.; (b) £100. 0s. 0d. — £37. 2s.  $6\frac{1}{2}$ d.
3. Father planted 17 rows of plants with 39 in a row and had 23 left over. How many plants had he at first?
4. Find the total cost of 225 halfpenny stamps and 225 penny stamps.
5. The butcher's boy had in his basket  $3\frac{1}{2}$  lb. of beef, 2 lb. 7 oz. of mutton, and  $\frac{3}{4}$  lb. of suet. What weight altogether had he in the basket?

#### B

1. (a) £17s. 11s. 3d. + £19. 9s. 7d. + £14. 13s. 5d. — £29. 18s. 9d. (b)  $1s. 7d. \times 25$ ; (c) £34. 12s. 6d.  $\div 10$ .
2. 5 yd. 2 ft. 4 in. — 2 yd. 2 ft. 7 in.
3. A baker has 798 pastries which he sells at 7 for 6d. How much money does he get for all the pastries?
4. A bus started at 9 a.m. and reached the end of its journey at 10.45 a.m. If it travelled at the rate of 20 miles per hour, how many miles was the journey?
5. Eggs are sold at 1s. 9d. a dozen. How much must be paid for 8 eggs?

#### C

1. (a)  $127 \times 32$ ; (b)  $1s. 6\frac{1}{2}d. \times 18$ ; (c)  $3,717 \div 45$ .
2. Chairs are bought for 5s. 9d. and sold for 9s. 6d. How much profit is made on 1 dozen chairs?
3. Share 45 guineas equally among 5 men and 4 women.
4. 145 sixpences — 145 threepences.
5. A draper has 20 yards of ribbon. One customer buys  $2\frac{1}{2}$  ft. and another buys 3 ft. 9 in. What length is left?

#### D

1. (a)  $3,217 + 2,169 + 953 - 2,178$ ; (b) £10. 14s.  $0\frac{1}{2}$ d.  $\div 11$ ; (c) £93. 7s. 3d. — £17. 17s. 6d.
2. How many  $\frac{1}{2}$ -pint bottles of milk can be filled from a churn holding 7 gall. 2 qt.? What is the milk worth at  $6\frac{1}{2}$ d. a quart?
3. How many 8d. balls can be bought for £1. 12s.?
4. (a)  $\frac{1}{2} + \frac{1}{4} + \frac{1}{3}$  of £1; (b)  $1\frac{5}{8} - \frac{2}{3}$ .
5. A bat was marked 12s. 6d. Another one was marked 3s. 9d. more. What would the two bats cost?



## Exercise 50

### Tests

#### ANSWERS

##### A

1. (a) 3,968; (b) 2,877; (c) 85 (6 R).      2. (a) £55. 10s. 8d.; (b) £62. 17s. 5½d.  
3. 686.      4. £1. 8s. 1½d.      5. 6 lb. 11 oz.

##### B

1. (a) £21. 15s. 6d.; (b) £1. 19s. 7d.; (c) £3. 9s. 3d.      2. 2 yd. 2 ft. 9 in.  
3. £2. 17s.      4. 35 miles.      5. 1s. 2d.

##### C

1. (a) 4,064; (b) £1. 7s. 9d.; (c) 82 (27 R).      2. £2. 5s.      3. £5. 5s.  
4. £1. 16s. 3d.      5. 17 yd. 2 ft. 9 in.

##### D

1. (a) 4,161; (b) 19s. 5½d.; (c) £75. 9s. 9d.      2. 120; 16s. 3d.      3. 48.  
4. (a) £1. 1s. 8d.; (b) 1½.      5. £1. 8s. 9d.

#### MENTAL TEST

(Write answers only — 10 mins. allowed)

- Oranges are 7 for 6d. How many for 3s. 6d.? (49.)
- 100 envelopes at 25 for 2½d. (10d.)
- 1½ lb. of bacon at 1s. 6d. (1s. 10½d.)
- The bus leaves at 10.50 a.m. and arrives at 11.35 a.m. How long does it take? (45 min.)
- How many balls at 7½d. each for 7s. 6d.? (12.)
- A year of 365 days has 52 Sundays. Find the cost of the penny daily papers (one each weekday) for a year. (£1. 6s. 1d.)
- 3½ ft. — 2½ ft. (Ans. in ft. and in.) (1 ft. 7½ in.)
- A paper boy bought 2 dozen newspapers for 1s. 3d. and sold them at 1d. each. Find his profit. (9d.)
- How many ¼-lb. packets can be made from 2½ lb.? (10.)
- How much short of 2s. 6d. is 11½d. + 9½d.? (9d.)

#### TABLE TEST

(To be dictated at intervals of 5 seconds)

- $7 \times 5$  (35).      2.  $132 \div 12$  (11).      3. 95d. (7s. 11d.).      4. 3 lb. 2 oz. to oz. (50 oz.).
5. 7s. 9d. to d. (93d.).      6. 3 tons 11 cwt. (71 cwt.).
7. 197s. (£9. 17s.).      8. 1 sq. ft. 20 sq. in. (164 sq. in.).      9. 4 gall. 2 qt. to qt. (18).
10. 100 halfpence to s. d. (4s. 2d.).      11.  $9 \times 5$  (45).      12.  $11 \times 11$  (121).
13. 101d. to s. d. (8s. 5d.).      14. 2 dy. 3 hr. to hr. (51 hr.).
15. 1 st. 7 lb. to lb. (21 lb.).      16.  $1\frac{1}{10}$  hr. to mins. (66 min.).

(50a)









